

```
1737 0 OUTPUT ACTIVATE WeightedKappaOutput.  
1737 0 M> OUTPUT ACTIVATE WeightedKappaOutput.  
1738 0 TITLE 'Quadratic Weighted Kappa'.  
1738 0 M> TITLE 'Quadratic Weighted Kappa'.
```

Quadratic Weighted Kappa

```

1739 0
1739 0 M>
1740 0 GET DATA
1740 0 M> GET DATA
1741 0 /TYPE=TXT
1741 0 M> /TYPE=TXT
1742 0 /FILE='D:\DATA ANALYSIS\K Reliability and Agreement Tests\Weighted
Kappa\dataset.csv'
1742 0 M> /FILE='D:\DATA ANALYSIS\K Reliability and Agreement Tests\Weight
ed Kappa\dataset.csv'
1743 0 /ENCODING='UTF8'
1743 0 M> /ENCODING='UTF8'
1744 0 /DELCASE=LINE
1744 0 M> /DELCASE=LINE
1745 0 /DELIMITERS=', '
1745 0 M> /DELIMITERS=', '
1746 0 /QUALIFIER='''
1746 0 M> /QUALIFIER='''
1747 0 /ARRANGEMENT=DELIMITED
1747 0 M> /ARRANGEMENT=DELIMITED
1748 0 /FIRSTCASE=2
1748 0 M> /FIRSTCASE=2
1749 0 /VARIABLES=
1749 0 M> /VARIABLES=
1750 0 school A8 sex A8 age F8.0 address A8 famsize A8 Pstatus A8
1750 0 M> school A8 sex A8 age F8.0 address A8 famsize A8 Pstatus A8
1751 0 Medu F8.0 Fedu F8.0 Mjob A16 Fjob A16 reason A16 guardian A16
1751 0 M> Medu F8.0 Fedu F8.0 Mjob A16 Fjob A16 reason A16 guardian A16
1752 0 traveltime F8.0 studytime F8.0 failures F8.0 schoolsup A8 famsup
A8
1752 0 M> traveltime F8.0 studytime F8.0 failures F8.0 schoolsup A8 fams
up A8
1753 0 paid A8 activities A8 nursery A8 higher A8 internet A8 romantic A
8
1753 0 M> paid A8 activities A8 nursery A8 higher A8 internet A8 romanti
c A8
1754 0 famrel F8.0 freetime F8.0 goout F8.0 Dalc F8.0 Walc F8.0 health F
8.0

```

Quadratic Weighted Kappa

```
1754 0 M> famrel F8.0 freetime F8.0 goout F8.0 Dalc F8.0 Walc F8.0 health F8.0
1755 0 absences F8.0 G1 F8.0 G2 F8.0 G3 F8.0.
1755 0 M> absences F8.0 G1 F8.0 G2 F8.0 G3 F8.0.
1756 0 DATASET NAME WeightedKappaData.
1756 0 M> DATASET NAME WeightedKappaData.
1757 0 EXECUTE.
1757 0 M> EXECUTE.
1758 0
1758 0 M>
1759 0 COMPUTE subject_id=$CASENUM.
1759 0 M> COMPUTE subject_id=$CASENUM.
1760 0 COMPUTE Dalc_R=6-Dalc.
1760 0 M> COMPUTE Dalc_R=6-Dalc.
1761 0 COMPUTE Walc_R=6-Walc.
1761 0 M> COMPUTE Walc_R=6-Walc.
1762 0 RECODE schoolsup famsup paid activities higher internet ('no'=0) ('yes'=1)
1762 0 M> RECODE schoolsup famsup paid activities higher internet ('no'=0) ('yes'=1)
1763 0 INTO schoolsup_b famsup_b paid_b activities_b higher_b internet_b.
1763 0 M> INTO schoolsup_b famsup_b paid_b activities_b higher_b internet_b.
1764 0 RECODE G1 G2 G3 (LO THRU 9=1) (10 THRU 13=2) (14 THRU HI=3)
1764 0 M> RECODE G1 G2 G3 (LO THRU 9=1) (10 THRU 13=2) (14 THRU HI=3)
1765 0 INTO G1_cat3 G2_cat3 G3_cat3.
1765 0 M> INTO G1_cat3 G2_cat3 G3_cat3.
1766 0 RECODE G1 G3 (LO THRU 8=1) (9 THRU 10=2) (11 THRU 12=3) (13 THRU 14=4) (15 THRU HI=5)
1766 0 M> RECODE G1 G3 (LO THRU 8=1) (9 THRU 10=2) (11 THRU 12=3) (13 THRU 14=4) (15 THRU HI=5)
1767 0 INTO G1_cat5 G3_cat5.
1767 0 M> INTO G1_cat5 G3_cat5.
1768 0 VARIABLE LEVEL schoolsup_b famsup_b paid_b activities_b higher_b internet_b G1_cat3 G2_cat3 G3_cat3 G1_cat5 G3_cat5 (NOMINAL).
1768 0 M> VARIABLE LEVEL schoolsup_b famsup_b paid_b activities_b higher_b internet_b G1_cat3 G2_cat3 G3_cat3 G1_cat5 G3_cat5 (NOMINAL).
```

Quadratic Weighted Kappa

```
1769 0 FORMATS subject_id schoolsup_b famsup_b paid_b activities_b higher_b
internet_b G1_cat3 G2_cat3 G3_cat3 G1_cat5 G3_cat5 (F5
      .0).
1769 0 M> FORMATS subject_id schoolsup_b famsup_b paid_b activities_b higher
_b internet_b G1_cat3 G2_cat3 G3_cat3 G1_cat5 G3_cat5
      (F5.0).
1770 0 EXECUTE.
1770 0 M> EXECUTE.
1771 0
1771 0 M>
1772 0 * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
1772 0 M> * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
1773 0 TITLE 'Quadratic Weighted Kappa'.
1773 0 M> TITLE 'Quadratic Weighted Kappa'.
```

Quadratic Weighted Kappa

```
1774 0 SUBTITLE 'Five ordered G1 G3 categories with squared-distance disagree  
ment penalties'.
```

```
1774 0 M> SUBTITLE 'Five ordered G1 G3 categories with squared-distance disa  
greement penalties'.
```

```
>Warning # 2004 on line 1774. Command name: SUBTITLE
```

```
>The subtitle given exceeds 60 characters in length. The first 60 characters  
>will be used.
```

Quadratic Weighted Kappa
Five ordered G1 G3 categories with squared-distance disagree

1775 0 CROSSTABS /TABLES=G1_cat5 BY G3_cat5 /STATISTICS=KAPPA /CELLS=COUNT ROW COLUMN EXPECTED RESID.

1775 0 M> CROSSTABS /TABLES=G1_cat5 BY G3_cat5 /STATISTICS=KAPPA /CELLS=COUNT ROW COLUMN EXPECTED RESID.

Crosstabs

Notes

Output Created		16-JUL-2026 21:10:53
Comments		
Input	Data	D:\DATA ANALYSIS\K Reliability and Agreement Tests\Weighted Kappa\dataset.csv
	Active Dataset	WeightedKappaData
	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=G1_cat5 BY G3_cat5 /STATISTICS=KAPPA /CELLS=COUNT ROW COLUMN EXPECTED RESID.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.03
	Dimensions Requested	2
	Cells Available	524245

[WeightedKappaData]

Quadratic Weighted Kappa
Five ordered G1 G3 categories with squared-distance disagree

Case Processing Summary

	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
G1_cat5 * G3_cat5	649	100.0%	0	0.0%	649	100.0%

G1_cat5 * G3_cat5 Crosstabulation

			G3_cat5				
			1	2	3	4	5
G1_cat5	1	Count	50	37	5	0	0
		Expected Count	9.2	18.7	24.9	20.6	18.6
		% within G1_cat5	54.3%	40.2%	5.4%	0.0%	0.0%
		% within G3_cat5	76.9%	28.0%	2.8%	0.0%	0.0%
		Residual	40.8	18.3	-19.9	-20.6	-18.6
	2	Count	14	73	65	7	1
		Expected Count	16.0	32.5	43.4	35.7	32.3
		% within G1_cat5	8.8%	45.6%	40.6%	4.4%	0.6%
		% within G3_cat5	21.5%	55.3%	36.9%	4.8%	0.8%
		Residual	-2.0	40.5	21.6	-28.7	-31.3
	3	Count	1	21	88	56	7
		Expected Count	17.3	35.2	46.9	38.7	34.9
		% within G1_cat5	0.6%	12.1%	50.9%	32.4%	4.0%
		% within G3_cat5	1.5%	15.9%	50.0%	38.6%	5.3%
		Residual	-16.3	-14.2	41.1	17.3	-27.9
	4	Count	0	1	18	76	48
		Expected Count	14.3	29.1	38.8	31.9	28.9
		% within G1_cat5	0.0%	0.7%	12.6%	53.1%	33.6%
		% within G3_cat5	0.0%	0.8%	10.2%	52.4%	36.6%
		Residual	-14.3	-28.1	-20.8	44.1	19.1
	5	Count	0	0	0	6	75
		Expected Count	8.1	16.5	22.0	18.1	16.3
		% within G1_cat5	0.0%	0.0%	0.0%	7.4%	92.6%
		% within G3_cat5	0.0%	0.0%	0.0%	4.1%	57.3%
		Residual	-8.1	-16.5	-22.0	-12.1	58.7

Quadratic Weighted Kappa
Five ordered G1 G3 categories with squared-distance disagree

G1_cat5 * G3_cat5 Crosstabulation

			Total
G1_cat5	1	Count	92
		Expected Count	92.0
		% within G1_cat5	100.0%
		% within G3_cat5	14.2%
		Residual	
	2	Count	160
		Expected Count	160.0
		% within G1_cat5	100.0%
		% within G3_cat5	24.7%
		Residual	
	3	Count	173
		Expected Count	173.0
		% within G1_cat5	100.0%
		% within G3_cat5	26.7%
		Residual	
	4	Count	143
		Expected Count	143.0
		% within G1_cat5	100.0%
		% within G3_cat5	22.0%
		Residual	
	5	Count	81
		Expected Count	81.0
		% within G1_cat5	100.0%
		% within G3_cat5	12.5%
		Residual	

Quadratic Weighted Kappa
Five ordered G1 G3 categories with squared-distance disagree

G1_cat5 * G3_cat5 Crosstabulation

		G3_cat5				
		1	2	3	4	5
Total	Count	65	132	176	145	131
	Expected Count	65.0	132.0	176.0	145.0	131.0
	% within G1_cat5	10.0%	20.3%	27.1%	22.3%	20.2%
	% within G3_cat5	100.0%	100.0%	100.0%	100.0%	100.0%

G1_cat5 * G3_cat5 Crosstabulation

		Total
Total	Count	649
	Expected Count	649.0
	% within G1_cat5	100.0%
	% within G3_cat5	100.0%

Symmetric Measures

		Value	Asymptotic Standard Error ^a	Approximate T ^b	Approximate Significance
Measure of Agreement	Kappa	.439	.025	22.038	.000
N of Valid Cases		649			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

```
1776  0  NONPAR CORR VARIABLES=G1_cat5 G3_cat5 /PRINT=SPEARMAN TWOTAIL /MISSIN
G=PAIRWISE.
```

```
1776  0 M> NONPAR CORR VARIABLES=G1_cat5 G3_cat5 /PRINT=SPEARMAN TWOTAIL /MIS
SING=PAIRWISE.
```

Nonparametric Correlations

Quadratic Weighted Kappa
Five ordered G1 G3 categories with squared-distance disagree

Notes

Output Created		16-JUL-2026 21:10:53
Comments		
Input	Data	D:\DATA ANALYSIS\K Reliability and Agreement Tests\Weighted Kappa\dataset.csv
	Active Dataset	WeightedKappaData
	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 pair of variables are based on all the cases with valid data for that pair.
Syntax		NONPAR CORR VARIABLES=G1_cat5 G3_cat5 /PRINT=SPEARMAN TWOTAIL /MISSING=PAIRWISE.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.02
	Number of Cases Allowed	629145 cases ^a

a. Based on availability of workspace memory

Quadratic Weighted Kappa
Five ordered G1 G3 categories with squared-distance disagree

Correlations

			G1_cat5	G3_cat5
Spearman's rho	G1_cat5	Correlation Coefficient	1.000	.850
		Sig. (2-tailed)	.	.000
		N	649	649
	G3_cat5	Correlation Coefficient	.850	1.000
		Sig. (2-tailed)	.000	.
		N	649	649

```
1777 0 COMPUTE wk_squared_distance=(G1_cat5-G3_cat5)**2/16.
1777 0 M> COMPUTE wk_squared_distance=(G1_cat5-G3_cat5)**2/16.
1778 0 DESCRIPTIVES VARIABLES=wk_squared_distance /STATISTICS=MEAN STDDEV MI
N MAX.
1778 0 M> DESCRIPTIVES VARIABLES=wk_squared_distance /STATISTICS=MEAN STDDEV
MIN MAX.
```

Descriptives

Notes

Output Created		16-JUL-2026 21:10:53
Comments		
Input	Data	D:\DATA ANALYSIS\K Reliability and Agreement Tests\Weighted Kappa\dataset.csv
	Active Dataset	WeightedKappaData
	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.

Quadratic Weighted Kappa
Five ordered G1 G3 categories with squared-distance disagree

Notes

Syntax		DESCRIPTIVES VARIABLES=wk_squared_distance /STATISTICS=MEAN STDDEV MIN MAX.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.02

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
wk_squared_distance	649	.00	.56	.0345	.05404
Valid N (listwise)	649				

1779 0 FREQUENCIES VARIABLES=wk_squared_distance /STATISTICS=MEAN STDDEV /HISTOGRAM.

1779 0 M> FREQUENCIES VARIABLES=wk_squared_distance /STATISTICS=MEAN STDDEV /HISTOGRAM.

Frequencies

Quadratic Weighted Kappa
Five ordered G1 G3 categories with squared-distance disagree

Notes

Output Created		16-JUL-2026 21:10:53
Comments		
Input	Data	D:\DATA ANALYSIS\K Reliability and Agreement Tests\Weighted Kappa\dataset.csv
	Active Dataset	WeightedKappaData
	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=wk_squared_distance /STATISTICS=MEAN STDDEV /HISTOGRAM.
Resources	Processor Time	00:00:00.17
	Elapsed Time	00:00:00.13

Statistics

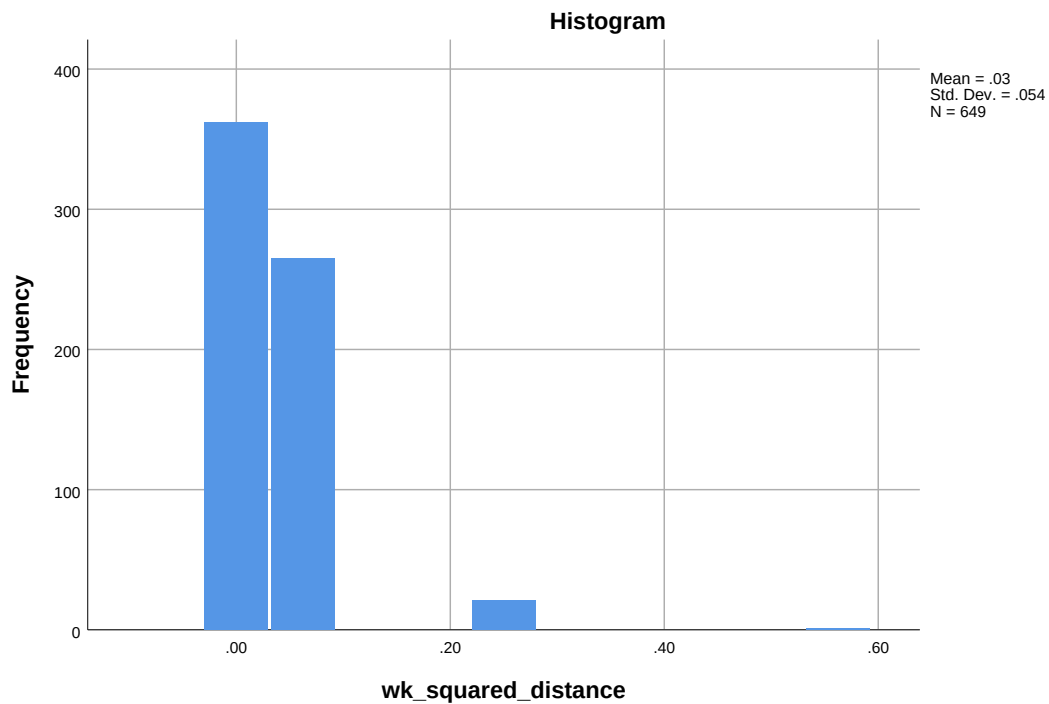
wk_squared_distance

N	Valid	649
	Missing	0
Mean		.0345
Std. Deviation		.05404

Quadratic Weighted Kappa
Five ordered G1 G3 categories with squared-distance disagree

wk_squared_distance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	362	55.8	55.8	55.8
	.06	265	40.8	40.8	96.6
	.25	21	3.2	3.2	99.8
	.56	1	.2	.2	100.0
	Total	649	100.0	100.0	



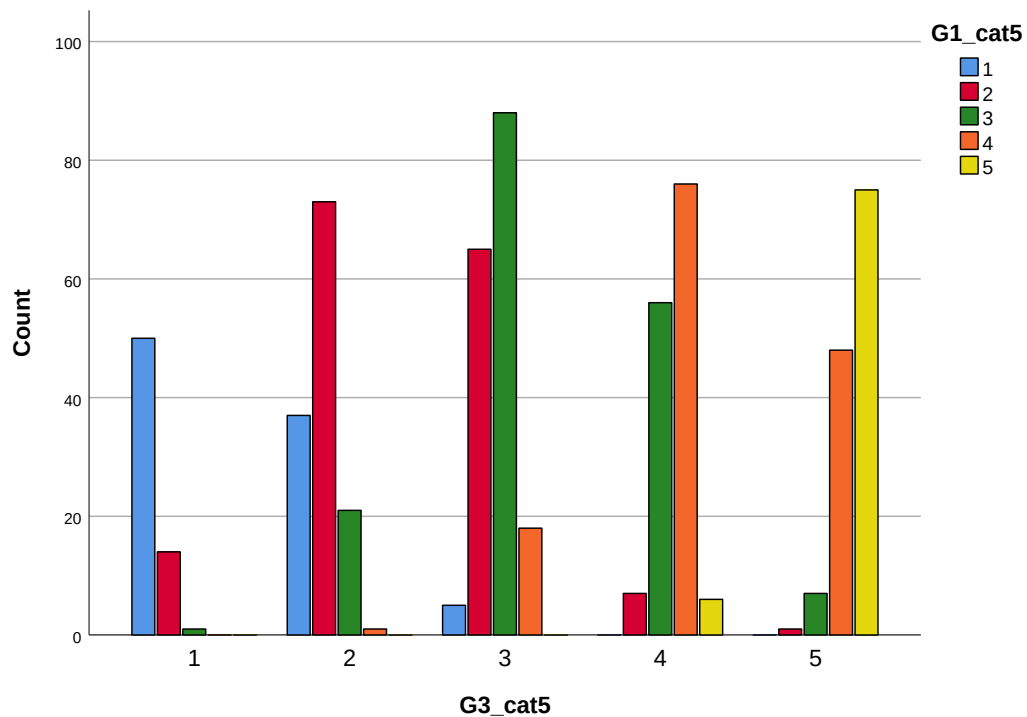
```
1780 0 GRAPH /BAR(GROUPED)=COUNT BY G3_cat5 BY G1_cat5.
1780 0 M> GRAPH /BAR(GROUPED)=COUNT BY G3_cat5 BY G1_cat5.
```

Graph

Quadratic Weighted Kappa
Five ordered G1 G3 categories with squared-distance disagree

Notes

Output Created		16-JUL-2026 21:10:53
Comments		
Input	Data	D:\DATA ANALYSIS\K Reliability and Agreement Tests\Weighted Kappa\dataset.csv
	Active Dataset	WeightedKappaData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Syntax		GRAPH /BAR(GROUPED) =COUNT BY G3_cat5 BY G1_cat5.
Resources	Processor Time	00:00:00.16
	Elapsed Time	00:00:00.15



Quadratic Weighted Kappa
Five ordered G1 G3 categories with squared-distance disagree

```

1781 0 * END METHOD-SPECIFIC SPSS WORKFLOW.
1781 0 M> * END METHOD-SPECIFIC SPSS WORKFLOW.
1782 0
1782 0 M>
1783 0 SAVE OUTFILE='D:\DATA ANALYSIS\K Reliability and Agreement Tests\Weighted Kappa\SPSS_Output\sav\weighted-kappa_spss_ready_data.sav' /COMPRESSED.
1783 0 M> SAVE OUTFILE='D:\DATA ANALYSIS\K Reliability and Agreement Tests\Weighted Kappa\SPSS_Output\sav\weighted-kappa_spss_ready_data.sav' /COMPRESSED.

1784 0
1784 0 M>
1785 0 ECHO '=====
====='.
1785 0 M> ECHO '=====
====='.

=====
1786 0 ECHO 'QUADRATIC WEIGHTED KAPPA'.
1786 0 M> ECHO 'QUADRATIC WEIGHTED KAPPA'.
QUADRATIC WEIGHTED KAPPA
1787 0 ECHO 'Design: Ordinal agreement between five-category G1 and G3 ratings with quadratic disagreement penalties.'.
1787 0 M> ECHO 'Design: Ordinal agreement between five-category G1 and G3 ratings with quadratic disagreement penalties.'.
Design: Ordinal agreement between five-category G1 and G3 ratings with quadratic disagreement penalties.
1788 0 ECHO 'Null hypothesis: Observed quadratic disagreement equals chance disagreement from the margins.'.
1788 0 M> ECHO 'Null hypothesis: Observed quadratic disagreement equals chance disagreement from the margins.'.
Null hypothesis: Observed quadratic disagreement equals chance disagreement from the margins.
1789 0 ECHO 'Formula:  $\kappa_w = 1 - \frac{\sum w_{ij} O_{ij}}{\sum w_{ij} E_{ij}}$ ,  $w_{ij} = (i-j)^2 / (q-1)^2$ .'.
1789 0 M> ECHO 'Formula:  $\kappa_w = 1 - \frac{\sum w_{ij} O_{ij}}{\sum w_{ij} E_{ij}}$ ,  $w_{ij} = (i-j)^2 / (q-1)^2$ .'.
Formula:  $\kappa_w = 1 - \frac{\sum w_{ij} O_{ij}}{\sum w_{ij} E_{ij}}$ ,  $w_{ij} = (i-j)^2 / (q-1)^2$ .
1790 0 ECHO 'Variables: five-category G1, five-category G3'.
1790 0 M> ECHO 'Variables: five-category G1, five-category G3'.

```


Quadratic Weighted Kappa
Five ordered G1 G3 categories with squared-distance disagree

Variables: five-category G1, five-category G3

```
1791 0 ECHO 'Rows analyzed: 649'.
1791 0 M> ECHO 'Rows analyzed: 649'.
Rows analyzed: 649
1792 0 ECHO 'categories = 5'.
1792 0 M> ECHO 'categories = 5'.
categories = 5
1793 0 ECHO 'expected_weighted_disagreement = 0.1996751550922244'.
1793 0 M> ECHO 'expected_weighted_disagreement = 0.1996751550922244'.
expected_weighted_disagreement = 0.1996751550922244
1794 0 ECHO 'n_pairs = 649'.
1794 0 M> ECHO 'n_pairs = 649'.
n_pairs = 649
1795 0 ECHO 'observed_weighted_disagreement = 0.034476117103235754'.
1795 0 M> ECHO 'observed_weighted_disagreement = 0.034476117103235754'.
observed_weighted_disagreement = 0.034476117103235754
1796 0 ECHO 'quadratic_weighted_kappa = 0.8273389742088233'.
1796 0 M> ECHO 'quadratic_weighted_kappa = 0.8273389742088233'.
quadratic_weighted_kappa = 0.8273389742088233
1797 0 ECHO 'categories = 5'.
1797 0 M> ECHO 'categories = 5'.
categories = 5
1798 0 ECHO 'expected_weighted_disagreement = 0.1996751550922244'.
1798 0 M> ECHO 'expected_weighted_disagreement = 0.1996751550922244'.
expected_weighted_disagreement = 0.1996751550922244
1799 0 ECHO 'n_pairs = 649'.
1799 0 M> ECHO 'n_pairs = 649'.
n_pairs = 649
1800 0 ECHO 'observed_weighted_disagreement = 0.034476117103235754'.
1800 0 M> ECHO 'observed_weighted_disagreement = 0.034476117103235754'.
observed_weighted_disagreement = 0.034476117103235754
1801 0 ECHO 'quadratic_weighted_kappa = 0.8273389742088233'.
1801 0 M> ECHO 'quadratic_weighted_kappa = 0.8273389742088233'.
quadratic_weighted_kappa = 0.8273389742088233
1802 0 ECHO 'Cross-check status: pass'.
1802 0 M> ECHO 'Cross-check status: pass'.
Cross-check status: pass
1803 0 ECHO '=====
====='
```

Quadratic Weighted Kappa
Five ordered G1 G3 categories with squared-distance disagree

```
1803  0 M>  ECHO '=====
====='.
=====
1804  0
1804  0 M>
1805  0  OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\K Reliability and Agreement Tes
ts\Weighted Kappa\SPSS_Output\spv\weighted-kappa_spss_
      output.spv'.
1805  0 M>  OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\K Reliability and Agreement
Tests\Weighted Kappa\SPSS_Output\spv\weighted-kappa_sp
      ss_output.spv'.
1806  0  OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=PRI
NTSETTING
1806  0 M>  OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=
PRINTSETTING
```