

```
617 0 OUTPUT ACTIVATE LikertScaleDataAnalysisOutput.  
617 0 M> OUTPUT ACTIVATE LikertScaleDataAnalysisOutput.  
618 0 TITLE 'Likert Scale Data Analysis'.  
618 0 M> TITLE 'Likert Scale Data Analysis'.
```

Likert Scale Data Analysis

```
619 0
619 0 M>
620 0 GET DATA
620 0 M> GET DATA
621 0 /TYPE=TXT /FILE='D:\DATA ANALYSIS\M Survey and Likert Scale Analysis
\Likert Scale Data Analysis\dataset.csv' /ENCODING='UT
F8' /DELCASE=LINE /DELIMITERS=', ' /QUALIFIER='''
621 0 M> /TYPE=TXT /FILE='D:\DATA ANALYSIS\M Survey and Likert Scale Analy
sis\Likert Scale Data Analysis\dataset.csv' /ENCODING=
'UTF8' /DELCASE=LINE /DELIMITERS=', ' /QUALIFIER='''
622 0 /ARRANGEMENT=DELIMITED /FIRSTCASE=2
622 0 M> /ARRANGEMENT=DELIMITED /FIRSTCASE=2
623 0 /VARIABLES=
623 0 M> /VARIABLES=
624 0 school A8 sex A8 age F8.0 address A8 famsize A8 Pstatus A8 Medu F8.0
Fedu F8.0
624 0 M> school A8 sex A8 age F8.0 address A8 famsize A8 Pstatus A8 Medu F
8.0 Fedu F8.0
625 0 Mjob A16 Fjob A16 reason A16 guardian A16 traveltime F8.0 studytime
F8.0 failures F8.0
625 0 M> Mjob A16 Fjob A16 reason A16 guardian A16 traveltime F8.0 studyti
me F8.0 failures F8.0
626 0 schoolsup A8 famsup A8 paid A8 activities A8 nursery A8 higher A8 in
ternet A8 romantic A8
626 0 M> schoolsup A8 famsup A8 paid A8 activities A8 nursery A8 higher A8
internet A8 romantic A8
627 0 famrel F8.0 freetime F8.0 goout F8.0 Dalc F8.0 Walc F8.0 health F8.0
absences F8.0 G1 F8.0 G2 F8.0 G3 F8.0.
627 0 M> famrel F8.0 freetime F8.0 goout F8.0 Dalc F8.0 Walc F8.0 health F
8.0 absences F8.0 G1 F8.0 G2 F8.0 G3 F8.0.
628 0 DATASET NAME LikertScaleDataAnalysisData.
628 0 M> DATASET NAME LikertScaleDataAnalysisData.
629 0 COMPUTE subject_id=$CASENUM.
629 0 M> COMPUTE subject_id=$CASENUM.
630 0 COMPUTE Dalc_R=6-Dalc.
630 0 M> COMPUTE Dalc_R=6-Dalc.
631 0 COMPUTE Walc_R=6-Walc.
631 0 M> COMPUTE Walc_R=6-Walc.
```

Likert Scale Data Analysis

```
632 0 COMPUTE scale_score=MEAN.6(famrel,freetime,goout,Dalc_R,Walc_R,health
).
632 0 M> COMPUTE scale_score=MEAN.6(famrel,freetime,goout,Dalc_R,Walc_R,hea
lth).
633 0 RECODE sex ('F'=1) ('M'=2) INTO sex_code.
633 0 M> RECODE sex ('F'=1) ('M'=2) INTO sex_code.
634 0 RECODE school ('GP'=1) ('MS'=2) INTO school_code.
634 0 M> RECODE school ('GP'=1) ('MS'=2) INTO school_code.
635 0 RECODE higher internet ('no'=0) ('yes'=1) INTO higher_code internet_c
ode.
635 0 M> RECODE higher internet ('no'=0) ('yes'=1) INTO higher_code interne
t_code.
636 0 EXECUTE.
636 0 M> EXECUTE.
637 0
637 0 M>
638 0 * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
638 0 M> * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
639 0 TITLE 'Likert Scale Data Analysis'.
639 0 M> TITLE 'Likert Scale Data Analysis'.
```

Likert Scale Data Analysis

```
640 0 SUBTITLE 'Aligned scoring distribution reliability and item diagnosti  
cs'.
```

```
640 0 M> SUBTITLE 'Aligned scoring distribution reliability and item diagno  
stics'.
```

```
>Warning # 2004 on line 640. Command name: SUBTITLE
```

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

```
>will be used.
```

Likert Scale Data Analysis
Aligned scoring distribution reliability and item diagnostic

```

641  0  RECODE scale_score (LO THRU 2.499999=1) (2.5 THRU 3.499999=2) (3.5 THRU HI=3) INTO score_band.
641  0 M> RECODE scale_score (LO THRU 2.499999=1) (2.5 THRU 3.499999=2) (3.5 THRU HI=3) INTO score_band.
642  0  VALUE LABELS score_band 1 'Low' 2 'Moderate' 3 'High'.
642  0 M> VALUE LABELS score_band 1 'Low' 2 'Moderate' 3 'High'.
643  0  RELIABILITY /VARIABLES=famrel freetime goout Dalc_R Walc_R health /SCALE('Aligned Likert scale') ALL /MODEL=ALPHA /STATISTICS=DESCRIPTIVE SCALE CORR /SUMMARY=TOTAL.
643  0 M> RELIABILITY /VARIABLES=famrel freetime goout Dalc_R Walc_R health /SCALE('Aligned Likert scale') ALL /MODEL=ALPHA /STATISTICS=DESCRIPTIVE SCALE CORR /SUMMARY=TOTAL.

```

Reliability

Notes

Output Created		18-JUL-2026 13:21:29
Comments		
Input	Data	D:\DATA ANALYSIS\Survey and Likert Scale Analysis\Likert Scale Data Analysis\dataset.csv
	Active Dataset	LikertScaleDataAnalysisData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
	Matrix Input	D:\DATA ANALYSIS\Survey and Likert Scale Analysis\Likert Scale Data Analysis\likert_scale_data_analysis_spss_syntax.sps

Likert Scale Data Analysis
Aligned scoring distribution reliability and item diagnostic

Notes

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 for all variables in the procedure.
Syntax		RELIABILITY /VARIABLES=famrel freetime goout Dalc_R Walc_R health /SCALE ('Aligned Likert scale') ALL /MODEL=ALPHA /STATISTICS=DESCRIPTIVE SCALE CORR /SUMMARY=TOTAL.
Resources	Processor Time	00:00:00.05
	Elapsed Time	00:00:00.06

[LikertScaleDataAnalysisData]

Scale: Aligned Likert scale

Case Processing Summary

		N	%
Cases	Valid	649	100.0
	Excluded ^a	0	.0
	Total	649	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.112	.169	6

Likert Scale Data Analysis
Aligned scoring distribution reliability and item diagnostic

Item Statistics

	Mean	Std. Deviation	N
famrel	3.9307	.95572	649
freetime	3.1803	1.05109	649
goout	3.1849	1.17577	649
Dalc_R	4.4977	.92483	649
Walc_R	3.7196	1.28438	649
health	3.5362	1.44626	649

Inter-Item Correlation Matrix

	famrel	freetime	goout	Dalc_R	Walc_R	health
famrel	1.000	.129	.090	.076	.094	.110
freetime	.129	1.000	.346	-.110	-.120	.085
goout	.090	.346	1.000	-.245	-.389	-.016
Dalc_R	.076	-.110	-.245	1.000	.617	-.059
Walc_R	.094	-.120	-.389	.617	1.000	-.115
health	.110	.085	-.016	-.059	-.115	1.000

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
famrel	18.1186	6.778	.227	.053	-.056 ^a
freetime	18.8690	6.879	.151	.138	-.002 ^a
goout	18.8644	8.139	-.105	.258	.234
Dalc_R	17.5516	7.269	.139	.382	.022
Walc_R	18.3297	7.400	-.033	.456	.178
health	18.5131	6.806	-.010	.042	.165

a. The value is negative due to a negative average covariance among items. This violates reliability model assumptions. You may want to check item codings.

Likert Scale Data Analysis
Aligned scoring distribution reliability and item diagnostic

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
22.0493	8.819	2.96960	6

644 0 FREQUENCIES VARIABLES=scale_score score_band /STATISTICS=MEAN MEDIAN STDDEV MINIMUM MAXIMUM /BARChart FREQ.

644 0 M> FREQUENCIES VARIABLES=scale_score score_band /STATISTICS=MEAN MEDIAN STDDEV MINIMUM MAXIMUM /BARChart FREQ.

Frequencies

Notes

Output Created		18-JUL-2026 13:21:30
Comments		
Input	Data	D:\DATA ANALYSIS\Survey and Likert Scale Analysis\Likert Scale Data Analysis\dataset.csv
	Active Dataset	LikertScaleDataAnalysisData
	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=scale_score score_band /STATISTICS=MEAN MEDIAN STDDEV MINIMUM MAXIMUM /BARChart FREQ.
Resources	Processor Time	00:00:01.97
	Elapsed Time	00:00:01.07

Likert Scale Data Analysis
Aligned scoring distribution reliability and item diagnostic

Statistics

		scale_score	score_band
N	Valid	649	649
	Missing	0	0
Mean		3.6749	2.6872
Median		3.6667	3.0000
Std. Deviation		.49493	.48671
Minimum		2.00	1.00
Maximum		4.83	3.00

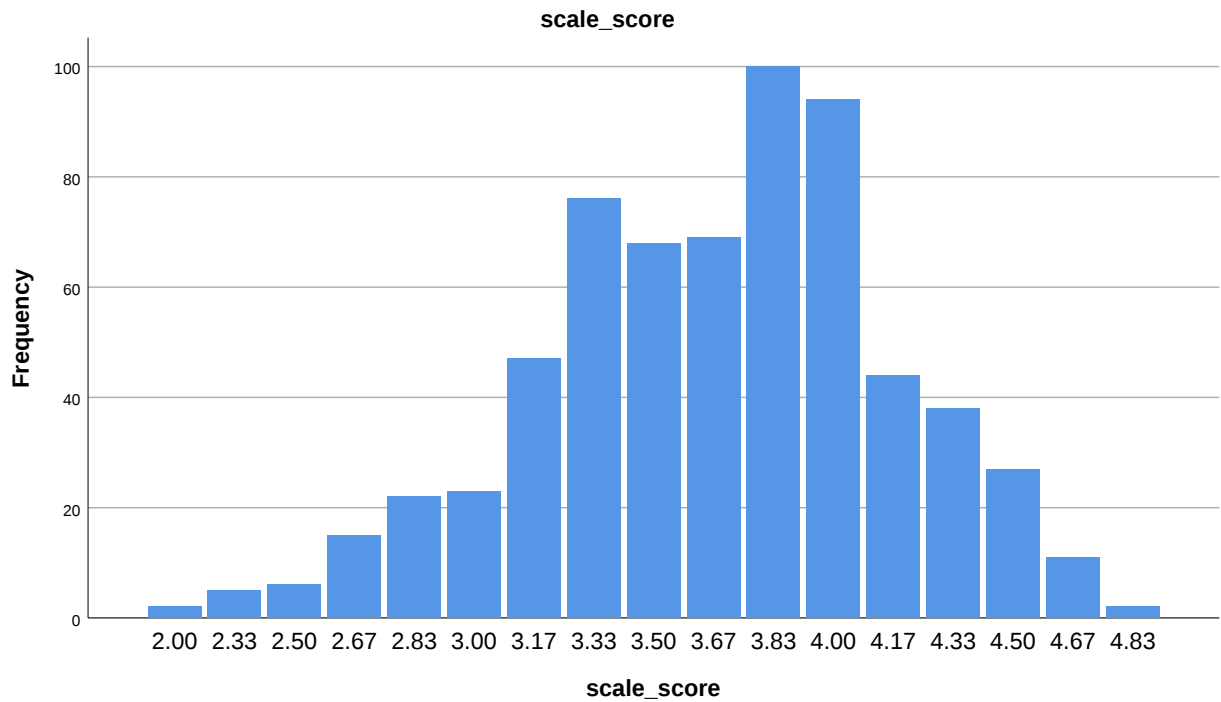
Frequency Table

		scale_score			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2.00	2	.3	.3	.3
	2.33	5	.8	.8	1.1
	2.50	6	.9	.9	2.0
	2.67	15	2.3	2.3	4.3
	2.83	22	3.4	3.4	7.7
	3.00	23	3.5	3.5	11.2
	3.17	47	7.2	7.2	18.5
	3.33	76	11.7	11.7	30.2
	3.50	68	10.5	10.5	40.7
	3.67	69	10.6	10.6	51.3
	3.83	100	15.4	15.4	66.7
	4.00	94	14.5	14.5	81.2
	4.17	44	6.8	6.8	88.0
	4.33	38	5.9	5.9	93.8
	4.50	27	4.2	4.2	98.0
	4.67	11	1.7	1.7	99.7
	4.83	2	.3	.3	100.0
	Total	649	100.0	100.0	

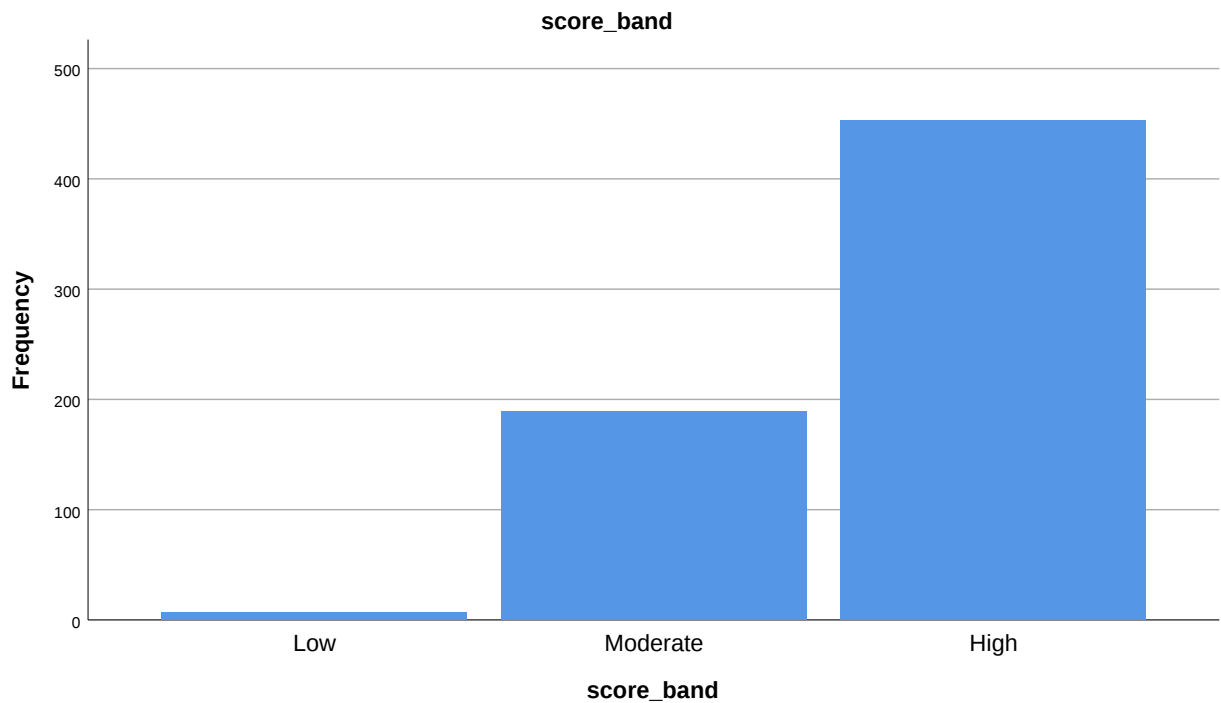
Likert Scale Data Analysis
Aligned scoring distribution reliability and item diagnostic

		score_band			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low	7	1.1	1.1	1.1
	Moderate	189	29.1	29.1	30.2
	High	453	69.8	69.8	100.0
	Total	649	100.0	100.0	

Bar Chart



Likert Scale Data Analysis
Aligned scoring distribution reliability and item diagnostic



```
645  0  FACTOR /VARIABLES=famrel freetime goout Dalc_R Walc_R health /CRITERI
A=FACTORS(1) /EXTRACTION=PC /ROTATION=NOROTATE /PRINT=
      INITIAL EXTRACTION.
```

```
645  0 M> FACTOR /VARIABLES=famrel freetime goout Dalc_R Walc_R health /CRIT
ERIA=FACTORS(1) /EXTRACTION=PC /ROTATION=NOROTATE /PRI
      NT=INITIAL EXTRACTION.
```

Factor Analysis

Likert Scale Data Analysis
Aligned scoring distribution reliability and item diagnostic

Notes

Output Created		18-JUL-2026 13:21:31
Comments		
Input	Data	D:\DATA ANALYSIS\IM Survey and Likert Scale Analysis\Likert Scale Data Analysis\dataset.csv
	Active Dataset	LikertScaleDataAnalysisD ata
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Missing Value Handling	Definition of Missing	MISSING=EXCLUDE: User-defined missing values are treated as missing.
	Cases Used	LISTWISE: Statistics are based on cases with no missing values for any variable used.
Syntax		FACTOR /VARIABLES=famrel freetime goout Dalc_R Walc_R health /CRITERIA=FACTORS(1) /EXTRACTION=PC /ROTATION=NOROTATE /PRINT=INITIAL EXTRACTION.
Resources	Processor Time	00:00:00.09
	Elapsed Time	00:00:00.10
	Maximum Memory Required	5704 (5.570K) bytes

Likert Scale Data Analysis
Aligned scoring distribution reliability and item diagnostic

Communalities

	Initial	Extraction
famrel	1.000	6.851E-6
freetime	1.000	.201
goout	1.000	.466
Dalc_R	1.000	.581
Walc_R	1.000	.693
health	1.000	.030

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Total	Initial Eigenvalues		Extraction Sums of Squared Loadings		
		% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.971	32.854	32.854	1.971	32.854	32.854
2	1.248	20.797	53.651			
3	1.024	17.060	70.711			
4	.807	13.446	84.156			
5	.604	10.064	94.220			
6	.347	5.780	100.000			

Extraction Method: Principal Component Analysis.

Likert Scale Data Analysis
Aligned scoring distribution reliability and item diagnostic

Component Matrix^a

	Component 1
famrel	-.003
freetime	-.448
goout	-.683
Dalc_R	.762
Walc_R	.833
health	-.173

Extraction Method:
Principal Component
Analysis.

a. 1 components extracted.

```

646 0 ECHO 'Reliability factor evidence score distribution and interpretabl
e bands are kept distinct'.
646 0 M> ECHO 'Reliability factor evidence score distribution and interpret
able bands are kept distinct'.
Reliability factor evidence score distribution and interpretable bands are kep
t distinct
647 0 * END METHOD-SPECIFIC SPSS WORKFLOW.
647 0 M> * END METHOD-SPECIFIC SPSS WORKFLOW.
648 0
648 0 M>
649 0 SAVE OUTFILE='D:\DATA ANALYSIS\M Survey and Likert Scale Analysis\Lik
ert Scale Data Analysis\SPSS_Output\sav\likert-scale-d
ata-analysis_spss_ready_data.sav' /COMPRESSED.
649 0 M> SAVE OUTFILE='D:\DATA ANALYSIS\M Survey and Likert Scale Analysis\
Likert Scale Data Analysis\SPSS_Output\sav\likert-scal
e-data-analysis_spss_ready_data.sav' /COMPRESSED.
650 0
650 0 M>
651 0 ECHO '=====
====='.

```

Likert Scale Data Analysis
Aligned scoring distribution reliability and item diagnostic

```

651  0 M> ECHO '=====
====='.
=====
652  0 ECHO 'LIKERT SCALE DATA ANALYSIS'.
652  0 M> ECHO 'LIKERT SCALE DATA ANALYSIS'.
LIKERT SCALE DATA ANALYSIS
653  0 ECHO 'Method type: scale_analysis'.
653  0 M> ECHO 'Method type: scale_analysis'.
Method type: scale_analysis
654  0 ECHO 'Design: Integrated scoring, distribution, reliability, item dia
gnostics, and interpretable score bands for a six-item
        scale.'.
654  0 M> ECHO 'Design: Integrated scoring, distribution, reliability, item
diagnostics, and interpretable score bands for a six-i
        tem scale.'.
Design: Integrated scoring, distribution, reliability, item diagnostics, and i
nterpretable score bands for a six-item scale.
655  0 ECHO 'Inference scope: No single omnibus hypothesis test is imposed;
the scale is evaluated through scoring, distribution,
        alpha, omega, and item-total evidence.'.
655  0 M> ECHO 'Inference scope: No single omnibus hypothesis test is impose
d; the scale is evaluated through scoring, distributio
        n, alpha, omega, and item-total evidence.'.
Inference scope: No single omnibus hypothesis test is imposed; the scale is ev
aluated through scoring, distribution, alpha, omega, a
656  0 ECHO 'Formula: score_i=mean(aligned items); alpha=k/(k-1)*(1-sum(s_i^
2)/s_total^2); omega=(sum(lambda))^2/[(sum(lambda))^2+
        sum(theta)].'.
656  0 M> ECHO 'Formula: score_i=mean(aligned items); alpha=k/(k-1)*(1-sum(s
_i^2)/s_total^2); omega=(sum(lambda))^2/[(sum(lambda))
        ^2+sum(theta)].'.
Formula: score_i=mean(aligned items); alpha=k/(k-1)*(1-sum(s_i^2)/s_total^2);
omega=(sum(lambda))^2/[(sum(lambda))^2+sum(theta)].
657  0 ECHO 'Variables: famrel, freetime, goout, Dalc, Walc, health'.
657  0 M> ECHO 'Variables: famrel, freetime, goout, Dalc, Walc, health'.
Variables: famrel, freetime, goout, Dalc, Walc, health
658  0 ECHO 'Rows analyzed: 649'.
658  0 M> ECHO 'Rows analyzed: 649'.
Rows analyzed: 649

```

Likert Scale Data Analysis
Aligned scoring distribution reliability and item diagnostic

```
659 0 ECHO 'cronbach_alpha = 0.1117626312468654'.
659 0 M> ECHO 'cronbach_alpha = 0.1117626312468654'.
cronbach_alpha = 0.1117626312468654
660 0 ECHO 'high_score_percent = 69.79969183359015'.
660 0 M> ECHO 'high_score_percent = 69.79969183359015'.
high_score_percent = 69.79969183359015
661 0 ECHO 'omega_total = 0.020155382121447452'.
661 0 M> ECHO 'omega_total = 0.020155382121447452'.
omega_total = 0.020155382121447452
662 0 ECHO 'respondents = 649'.
662 0 M> ECHO 'respondents = 649'.
respondents = 649
663 0 ECHO 'scale_mean = 3.674884437596302'.
663 0 M> ECHO 'scale_mean = 3.674884437596302'.
scale_mean = 3.674884437596302
664 0 ECHO 'scale_median = 3.666666666666665'.
664 0 M> ECHO 'scale_median = 3.666666666666665'.
scale_median = 3.666666666666665
665 0 ECHO 'scale_sd = 0.49493413588832214'.
665 0 M> ECHO 'scale_sd = 0.49493413588832214'.
scale_sd = 0.49493413588832214
666 0 ECHO 'Cross-check status: pass'.
666 0 M> ECHO 'Cross-check status: pass'.
Cross-check status: pass
667 0 ECHO '=====
====='.
667 0 M> ECHO '=====
====='.
=====
668 0
668 0 M>
669 0 OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\M Survey and Likert Scale Analy
sis\Likert Scale Data Analysis\SPSS_Output\spv\likert-
scale-data-analysis_spss_output.spv'.
669 0 M> OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\M Survey and Likert Scale An
alysis\Likert Scale Data Analysis\SPSS_Output\spv\like
rt-scale-data-analysis_spss_output.spv'.
670 0 OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=PRI
NTSETTING
```

Likert Scale Data Analysis
Aligned scoring distribution reliability and item diagnostic

```
670  0 M> OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=  
PRINTSETTING
```