

```
812 0 OUTPUT ACTIVATE OrdinalLogisticRegressionforLikertDataOutput.  
812 0 M> OUTPUT ACTIVATE OrdinalLogisticRegressionforLikertDataOutput.  
813 0 TITLE 'Ordinal Logistic Regression for Likert Data'.  
813 0 M> TITLE 'Ordinal Logistic Regression for Likert Data'.
```

Ordinal Logistic Regression for Likert Data

```
814 0
814 0 M>
815 0 GET DATA
815 0 M> GET DATA
816 0 /TYPE=TXT /FILE='D:\DATA ANALYSIS\M Survey and Likert Scale Analysis
\Ordinal Logistic Regression for Likert Data\dataset.c
sv' /ENCODING='UTF8' /DELCASE=LINE /DELIMITERS=', ' /QUALIFIER='''
816 0 M> /TYPE=TXT /FILE='D:\DATA ANALYSIS\M Survey and Likert Scale Analy
sis\Ordinal Logistic Regression for Likert Data\datase
t.csv' /ENCODING='UTF8' /DELCASE=LINE /DELIMITERS=', ' /QUALIFIE
R=''''
817 0 /ARRANGEMENT=DELIMITED /FIRSTCASE=2
817 0 M> /ARRANGEMENT=DELIMITED /FIRSTCASE=2
818 0 /VARIABLES=
818 0 M> /VARIABLES=
819 0 school A8 sex A8 age F8.0 address A8 famsize A8 Pstatus A8 Medu F8.0
Fedu F8.0
819 0 M> school A8 sex A8 age F8.0 address A8 famsize A8 Pstatus A8 Medu F
8.0 Fedu F8.0
820 0 Mjob A16 Fjob A16 reason A16 guardian A16 traveltime F8.0 studytime
F8.0 failures F8.0
820 0 M> Mjob A16 Fjob A16 reason A16 guardian A16 traveltime F8.0 studyti
me F8.0 failures F8.0
821 0 schoolsup A8 famsup A8 paid A8 activities A8 nursery A8 higher A8 in
ternet A8 romantic A8
821 0 M> schoolsup A8 famsup A8 paid A8 activities A8 nursery A8 higher A8
internet A8 romantic A8
822 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.
822 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.
823 0 DATASET NAME OrdinalLogisticRegressionforLikertDataData.
823 0 M> DATASET NAME OrdinalLogisticRegressionforLikertDataData.
824 0 COMPUTE subject_id=$CASENUM.
824 0 M> COMPUTE subject_id=$CASENUM.
825 0 COMPUTE Dalc_R=6-Dalc.
825 0 M> COMPUTE Dalc_R=6-Dalc.
826 0 COMPUTE Walc_R=6-Walc.
826 0 M> COMPUTE Walc_R=6-Walc.
```

Ordinal Logistic Regression for Likert Data

```
827 0 COMPUTE scale_score=MEAN.6(famrel,freetime,goout,Dalc_R,Walc_R,health
).
827 0 M> COMPUTE scale_score=MEAN.6(famrel,freetime,goout,Dalc_R,Walc_R,hea
lth).
828 0 RECODE sex ('F'=1) ('M'=2) INTO sex_code.
828 0 M> RECODE sex ('F'=1) ('M'=2) INTO sex_code.
829 0 RECODE school ('GP'=1) ('MS'=2) INTO school_code.
829 0 M> RECODE school ('GP'=1) ('MS'=2) INTO school_code.
830 0 RECODE higher internet ('no'=0) ('yes'=1) INTO higher_code internet_c
ode.
830 0 M> RECODE higher internet ('no'=0) ('yes'=1) INTO higher_code interne
t_code.
831 0 EXECUTE.
831 0 M> EXECUTE.
832 0
832 0 M>
833 0 * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
833 0 M> * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
834 0 TITLE 'Ordinal Logistic Regression for Likert Data'.
834 0 M> TITLE 'Ordinal Logistic Regression for Likert Data'.
```

Ordinal Logistic Regression for Likert Data

```
835 0 SUBTITLE 'Proportional-odds cumulative-logit model for famrel'.  
835 0 M> SUBTITLE 'Proportional-odds cumulative-logit model for famrel'.
```

Ordinal Logistic Regression for Likert Data
Proportional-odds cumulative-logit model for famrel

```

836 0 COMPUTE sex_male=(sex='M').
836 0 M> COMPUTE sex_male=(sex='M').
837 0 PLUM famrel WITH studytime age failures sex_male
837 0 M> PLUM famrel WITH studytime age failures sex_male
838 0 /CRITERIA=CIN(95) DELTA(0) MXITER(5000) MXSTEP(10) LCONVERGE(0) PCON
VERGE(1E-10) SINGULAR(1E-12)
838 0 M> /CRITERIA=CIN(95) DELTA(0) MXITER(5000) MXSTEP(10) LCONVERGE(0) P
CONVERGE(1E-10) SINGULAR(1E-12)
839 0 /LINK=LOGIT /PRINT=FIT PARAMETER SUMMARY TPARALLEL /SAVE=ESTPROB.
839 0 M> /LINK=LOGIT /PRINT=FIT PARAMETER SUMMARY TPARALLEL /SAVE=ESTPROB.

```

PLUM - Ordinal Regression

Notes

Output Created		18-JUL-2026 13:21:47
Comments		
Input	Data	D:\DATA ANALYSIS\ISM Survey and Likert Scale Analysis\Ordinal Logistic Regression for Likert Data\dataset.csv
	Active Dataset	OrdinalLogisticRegression forLikertDataData
	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 for all variables in the model.

Ordinal Logistic Regression for Likert Data
Proportional-odds cumulative-logit model for famrel

Notes

Syntax		PLUM famrel WITH studytime age failures sex_male /CRITERIA=CIN(95) DELTA(0) MXITER(5000) MXSTEP(10) LCONVERGE(0) PCONVERGE(1E-10) SINGULAR(1E-12) /LINK=LOGIT /PRINT=FIT PARAMETER SUMMARY TPARALLEL /SAVE=ESTPROB.
Resources	Processor Time	00:00:00.11
	Elapsed Time	00:00:00.12
Variables Created	EST1_1	Estimated Cell Probability for Response Category: 1
	EST2_1	Estimated Cell Probability for Response Category: 2
	EST3_1	Estimated Cell Probability for Response Category: 3
	EST4_1	Estimated Cell Probability for Response Category: 4
	EST5_1	Estimated Cell Probability for Response Category: 5

[OrdinalLogisticRegressionforLikertDataData]

Warnings

There are 239 (54.9%) cells (i.e., dependent variable levels by observed combinations of predictor variable values) with zero frequencies.

Ordinal Logistic Regression for Likert Data
Proportional-odds cumulative-logit model for famrel

Case Processing Summary

		N	Marginal Percentage
famrel	1	22	3.4%
	2	29	4.5%
	3	101	15.6%
	4	317	48.8%
	5	180	27.7%
Valid		649	100.0%
Missing		0	
Total		649	

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	566.789			
Final	559.264	7.525	4	.111

Link function: Logit.

Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	422.733	340	.001
Deviance	312.245	340	.857

Link function: Logit.

Pseudo R-Square

Cox and Snell	.012
Nagelkerke	.013
McFadden	.005

Link function: Logit.

Ordinal Logistic Regression for Likert Data
Proportional-odds cumulative-logit model for famrel

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% ... Lower Bound
Threshold	[famrel = 1]	-3.139	1.099	8.158	1	.004	-5.293
	[famrel = 2]	-2.249	1.087	4.277	1	.039	-4.380
	[famrel = 3]	-.961	1.082	.789	1	.374	-3.081
	[famrel = 4]	1.202	1.082	1.233	1	.267	-.920
Location	studytime	.051	.092	.313	1	.576	-.128
	age	.002	.064	.001	1	.972	-.123
	failures	-.217	.132	2.712	1	.100	-.476
	sex_male	.349	.154	5.135	1	.023	.047

Parameter Estimates

		95% Confidence . Upper Bound
Threshold	[famrel = 1]	-.985
	[famrel = 2]	-.118
	[famrel = 3]	1.159
	[famrel = 4]	3.323
Location	studytime	.231
	age	.127
	failures	.041
	sex_male	.650

Link function: Logit.

Test of Parallel Lines^a

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	559.264			
General	545.603	13.661	12	.323

The null hypothesis states that the location parameters (slope coefficients) are the same across response categories.

a. Link function: Logit.

Ordinal Logistic Regression for Likert Data
Proportional-odds cumulative-logit model for famrel

```
840 0 ECHO 'The likelihood-ratio comparison and common slopes belong to the
cumulative-logit model'.
840 0 M> ECHO 'The likelihood-ratio comparison and common slopes belong to
the cumulative-logit model'.
The likelihood-ratio comparison and common slopes belong to the cumulative-log
it model
841 0 * END METHOD-SPECIFIC SPSS WORKFLOW.
841 0 M> * END METHOD-SPECIFIC SPSS WORKFLOW.
842 0
842 0 M>
843 0 SAVE OUTFILE='D:\DATA ANALYSIS\M Survey and Likert Scale Analysis\Ord
inal Logistic Regression for Likert Data\SPSS_Output\s
av\ordinal-logistic-regression-for-likert-data_spss_ready_data.sav
' /COMPRESSED.
843 0 M> SAVE OUTFILE='D:\DATA ANALYSIS\M Survey and Likert Scale Analysis\
Ordinal Logistic Regression for Likert Data\SPSS_Outpu
t\sav\ordinal-logistic-regression-for-likert-data_spss_ready_da
ta.sav' /COMPRESSED.
844 0
844 0 M>
845 0 ECHO '=====
====='.
845 0 M> ECHO '=====
====='.
=====
846 0 ECHO 'ORDINAL LOGISTIC REGRESSION FOR LIKERT DATA'.
846 0 M> ECHO 'ORDINAL LOGISTIC REGRESSION FOR LIKERT DATA'.
ORDINAL LOGISTIC REGRESSION FOR LIKERT DATA
847 0 ECHO 'Method type: regression_model'.
847 0 M> ECHO 'Method type: regression_model'.
Method type: regression_model
848 0 ECHO 'Design: Cumulative-logit proportional-odds model for the five-l
evel family-relationship response.'.
848 0 M> ECHO 'Design: Cumulative-logit proportional-odds model for the fiv
e-level family-relationship response.'.
Design: Cumulative-logit proportional-odds model for the five-level family-rel
ationship response.
849 0 ECHO 'Inference scope: The applicable omnibus likelihood-ratio test c
omparees the fitted predictor model with the intercept-
```

Ordinal Logistic Regression for Likert Data
Proportional-odds cumulative-logit model for famrel

```
only ordinal model.'.
849 0 M> ECHO 'Inference scope: The applicable omnibus likelihood-ratio tes
t compares the fitted predictor model with the interce
pt-only ordinal model.'.
Inference scope: The applicable omnibus likelihood-ratio test compares the fit
ted predictor model with the intercept-only ordinal mo
850 0 ECHO 'Formula: logit[P(Y<=j)]=theta_j-X*beta; LR=2*(LL_model-LL_null)
.'.
850 0 M> ECHO 'Formula: logit[P(Y<=j)]=theta_j-X*beta; LR=2*(LL_model-LL_nu
ll).'.
Formula: logit[P(Y<=j)]=theta_j-X*beta; LR=2*(LL_model-LL_null).
851 0 ECHO 'Variables: famrel, studytime, age, failures, sex'.
851 0 M> ECHO 'Variables: famrel, studytime, age, failures, sex'.
Variables: famrel, studytime, age, failures, sex
852 0 ECHO 'Rows analyzed: 649'.
852 0 M> ECHO 'Rows analyzed: 649'.
Rows analyzed: 649
853 0 ECHO 'likelihood_ratio = 7.525407170097651'.
853 0 M> ECHO 'likelihood_ratio = 7.525407170097651'.
likelihood_ratio = 7.525407170097651
854 0 ECHO 'log_likelihood = -806.7073488321118'.
854 0 M> ECHO 'log_likelihood = -806.7073488321118'.
log_likelihood = -806.7073488321118
855 0 ECHO 'lr_df = 4'.
855 0 M> ECHO 'lr_df = 4'.
lr_df = 4
856 0 ECHO 'lr_p_value = 0.11059414851905408'.
856 0 M> ECHO 'lr_p_value = 0.11059414851905408'.
lr_p_value = 0.11059414851905408
857 0 ECHO 'mcfadden_r_squared = 0.004642618902236828'.
857 0 M> ECHO 'mcfadden_r_squared = 0.004642618902236828'.
mcfadden_r_squared = 0.004642618902236828
858 0 ECHO 'n_cases = 649'.
858 0 M> ECHO 'n_cases = 649'.
n_cases = 649
859 0 ECHO 'null_log_likelihood = -810.4700524171607'.
859 0 M> ECHO 'null_log_likelihood = -810.4700524171607'.
null_log_likelihood = -810.4700524171607
860 0 ECHO 'studytime_coefficient = 0.051229466550601156'.
```

Ordinal Logistic Regression for Likert Data
Proportional-odds cumulative-logit model for famrel

```
860  0 M> ECHO 'studytime_coefficient = 0.051229466550601156'.
studytime_coefficient = 0.051229466550601156
861  0 ECHO 'Cross-check status: pass'.
861  0 M> ECHO 'Cross-check status: pass'.
Cross-check status: pass
862  0 ECHO '=====
====='.
862  0 M> ECHO '=====
====='.
=====
863  0
863  0 M>
864  0 OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\M Survey and Likert Scale Analy
sis\Ordinal Logistic Regression for Likert Data\SPSS_0
      utput\spv\ordinal-logistic-regression-for-likert-data_spss_output.
spv'.
864  0 M> OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\M Survey and Likert Scale An
alysis\Ordinal Logistic Regression for Likert Data\SPS
      S_Output\spv\ordinal-logistic-regression-for-likert-data_spss_o
utput.spv'.
865  0 OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=PRI
NTSETTING
865  0 M> OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=
PRINTSETTING
```