

Host

Notes

Output Created		12-JUL-2026 15:45:32
Comments		
Input	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c if not exist "D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output " mkdir "D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output "'.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.17

Host

Notes

Output Created		12-JUL-2026 15:45:32
Comments		
Input	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c if not exist "D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\png" mkdir "D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\png"'
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.11

Host

Notes

Output Created		12-JUL-2026 15:45:32
Comments		
Input	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c if not exist "D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\csv" mkdir "D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\csv"'
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.11

Host

Notes

Output Created		12-JUL-2026 15:45:33
Comments		
Input	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c if not exist "D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\txt" mkdir "D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\txt"'.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.14

Host

Notes

Output Created		12-JUL-2026 15:45:33
Comments		
Input	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c if not exist "D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\sav" mkdir "D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\sav"'
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.17

Host

Notes

Output Created		12-JUL-2026 15:45:33
Comments		
Input	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c if not exist "D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\spv" mkdir "D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\spv"'
Resources	Processor Time	00:00:00.05
	Elapsed Time	00:00:00.11

Host

Notes

Output Created		12-JUL-2026 15:45:33
Comments		
Input	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c if not exist "D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\pdf" mkdir "D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\pdf"'.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.15

Host

Notes

Output Created		12-JUL-2026 15:45:33
Comments		
Input	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c del /q "D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\png*.png" 2>nul'.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.28

Host

Notes

Output Created		12-JUL-2026 15:45:33
Comments		
Input	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c del /q "D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\csv*.csv" 2>nul'.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.25

Host

Notes

Output Created		12-JUL-2026 15:45:34
Comments		
Input	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c del /q "D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\txt*.txt" 2>nul'.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.23

Host

Notes

Output Created		12-JUL-2026 15:45:34
Comments		
Input	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c del /q "D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\sav*.sav" 2>nul'.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.22

Host

Notes

Output Created		12-JUL-2026 15:45:34
Comments		
Input	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c del /q "D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\spv*.spv" 2>nul'.
Resources	Processor Time	00:00:00.03
	Elapsed Time	00:00:00.27

Host

Notes

Output Created		12-JUL-2026 15:45:34
Comments		
Input	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c del /q "D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\pdf*.pdf" 2>nul'.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.15

Traceback (most recent call last):

File "<string>", line 17, in <module>

TypeError: mkdir() got an unexpected keyword argument 'exist_ok'

Zero Inflated Negative Binomial Regression

Zero Inflated Negative Binomial Regression
Import data

school into school_id (Student school factor)

Old Value	New Value	Value	Label
-----------	-----------	-------	-------

GP	1	GP
----	---	----

MS	2	MS
----	---	----

sex into sex_id (Student sex factor)

Old Value	New Value	Value	Label
-----------	-----------	-------	-------

F	1	F
---	---	---

M	2	M
---	---	---

ZINB Descriptive Statistics

ZINBDescriptive Statistics
Count outcome and numeric predictors

Descriptives

Notes

Output Created		12-JUL-2026 15:45:36
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\sav\zero_inflated_negative_binomial_regression_sps_s_ready_data.sav
	Active Dataset	ZINBRegressionData
	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=absences G1 G2 G3 age studytime failures /STATISTICS=MEAN STDDEV MIN MAX.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01

[ZINBRegressionData] D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\sav\zero_inflated_negative_binomial_regression_sps_ready_data.sav

ZINB Descriptive Statistics
Count outcome and numeric predictors

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Count outcome: number of school absences	649	.00	32.00	3.6595	4.64076
First period grade predictor	649	.00	19.00	11.3991	2.74527
Second period grade predictor	649	.00	19.00	11.5701	2.91364
Final grade predictor	649	.00	19.00	11.9060	3.23066
Student age predictor	649	15.00	22.00	16.7442	1.21814
Weekly study time predictor	649	1.00	4.00	1.9307	.82951
Past class failures predictor	649	.00	3.00	.2219	.59324
Valid N (listwise)	649				

ZINBZero Frequency

ZINBZero Frequency
Observed zero and positive count cases

Frequencies

Notes

Output Created		12-JUL-2026 15:45:36
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\ sav\zero_inflated_negative _binomial_regression_sps s_ready_data.sav
	Active Dataset	ZINBRegressionData
	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=absences absences_zero school_id sex_id studytime failures /BARCHART FREQ /ORDER=ANALYSIS.
Resources	Processor Time	00:00:01.75
	Elapsed Time	00:00:01.92

Statistics

		Count outcome: number of school absences	Zero-process indicator: 1 when absences equals zero	Autorecoded school factor	Autorecoded sex factor	Weekly study time predictor
N	Valid	649	649	649	649	649
	Missing	0	0	0	0	0

ZINBZero Frequency
Observed zero and positive count cases

Statistics

		Past class failures predictor
N	Valid	649
	Missing	0

Frequency Table

Count outcome: number of school absences

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	244	37.6	37.6	37.6
	1.00	12	1.8	1.8	39.4
	2.00	110	16.9	16.9	56.4
	3.00	7	1.1	1.1	57.5
	4.00	93	14.3	14.3	71.8
	5.00	12	1.8	1.8	73.7
	6.00	49	7.6	7.6	81.2
	7.00	3	.5	.5	81.7
	8.00	42	6.5	6.5	88.1
	9.00	7	1.1	1.1	89.2
	10.00	21	3.2	3.2	92.4
	11.00	5	.8	.8	93.2
	12.00	12	1.8	1.8	95.1
	13.00	1	.2	.2	95.2
	14.00	8	1.2	1.2	96.5
	15.00	2	.3	.3	96.8
	16.00	10	1.5	1.5	98.3
	18.00	3	.5	.5	98.8
	21.00	2	.3	.3	99.1
	22.00	2	.3	.3	99.4
	24.00	1	.2	.2	99.5
	26.00	1	.2	.2	99.7

ZINBZero Frequency
Observed zero and positive count cases

Count outcome: number of school absences

	Frequency	Percent	Valid Percent	Cumulative Percent
30.00	1	.2	.2	99.8
32.00	1	.2	.2	100.0
Total	649	100.0	100.0	

Zero-process indicator: 1 when absences equals zero

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Positive count	405	62.4	62.4	62.4
	Zero count	244	37.6	37.6	100.0
	Total	649	100.0	100.0	

Autorecoded school factor

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	GP	423	65.2	65.2	65.2
	MS	226	34.8	34.8	100.0
	Total	649	100.0	100.0	

Autorecoded sex factor

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	F	383	59.0	59.0	59.0
	M	266	41.0	41.0	100.0
	Total	649	100.0	100.0	

ZINBZero Frequency
Observed zero and positive count cases

Weekly study time predictor

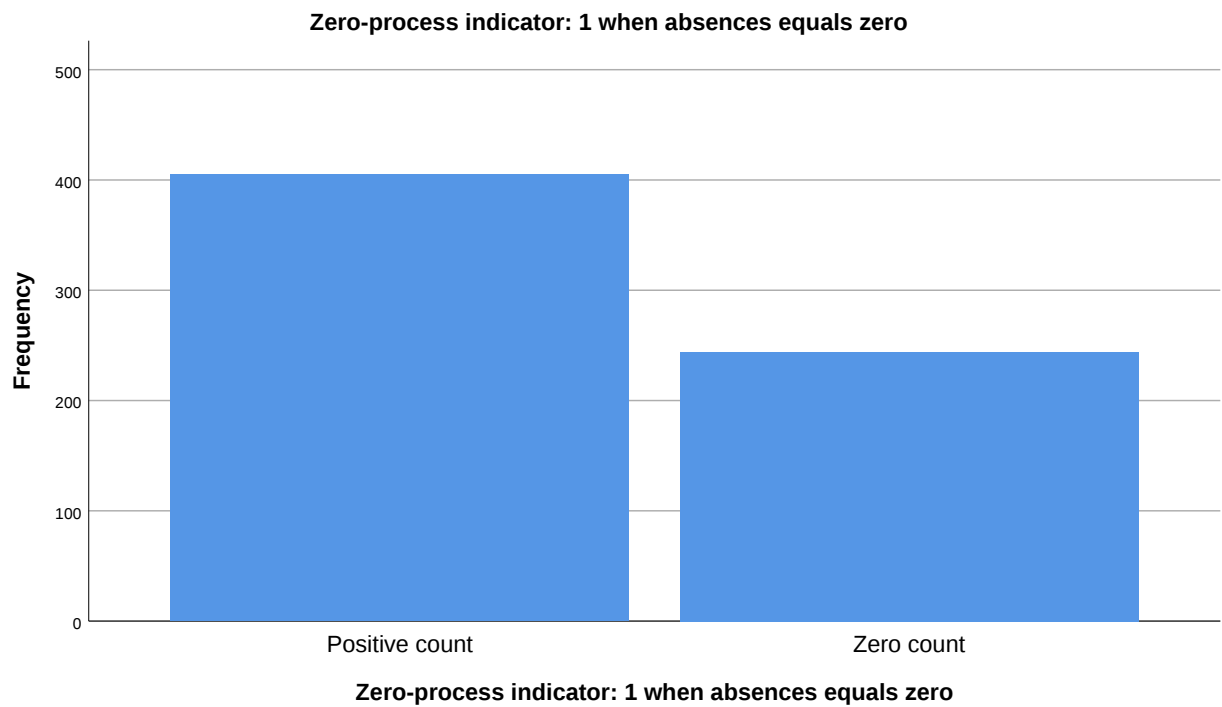
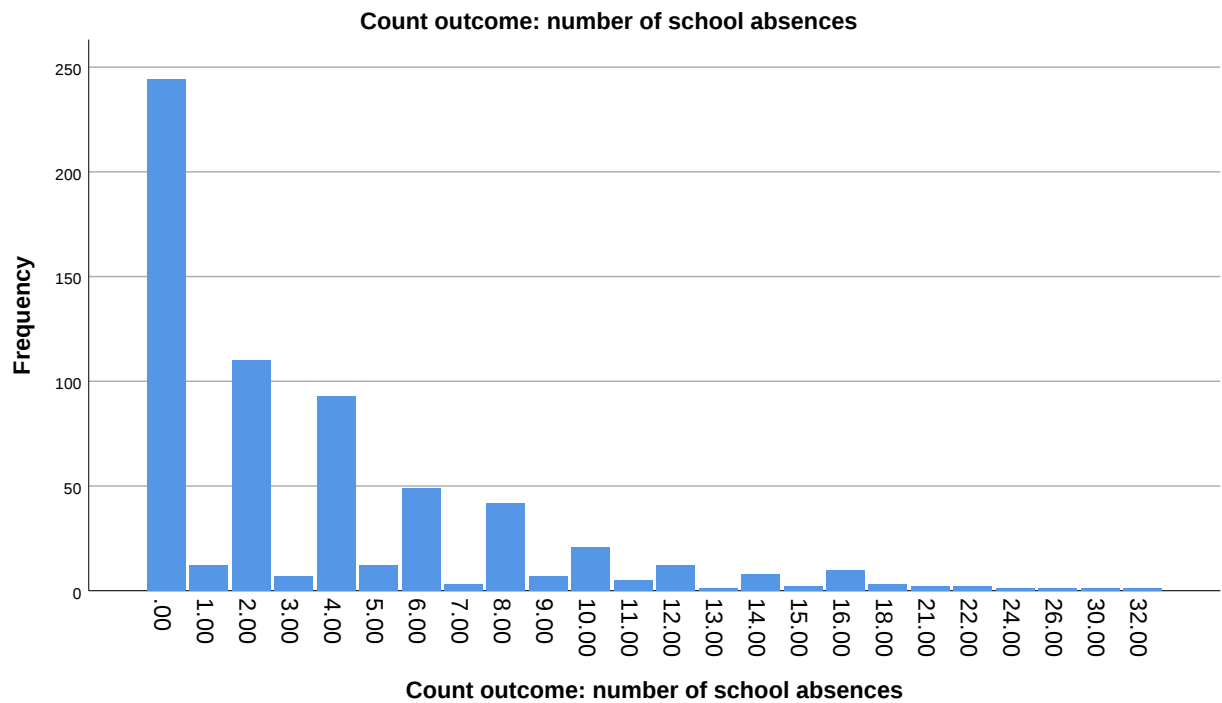
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	212	32.7	32.7	32.7
	2.00	305	47.0	47.0	79.7
	3.00	97	14.9	14.9	94.6
	4.00	35	5.4	5.4	100.0
	Total	649	100.0	100.0	

Past class failures predictor

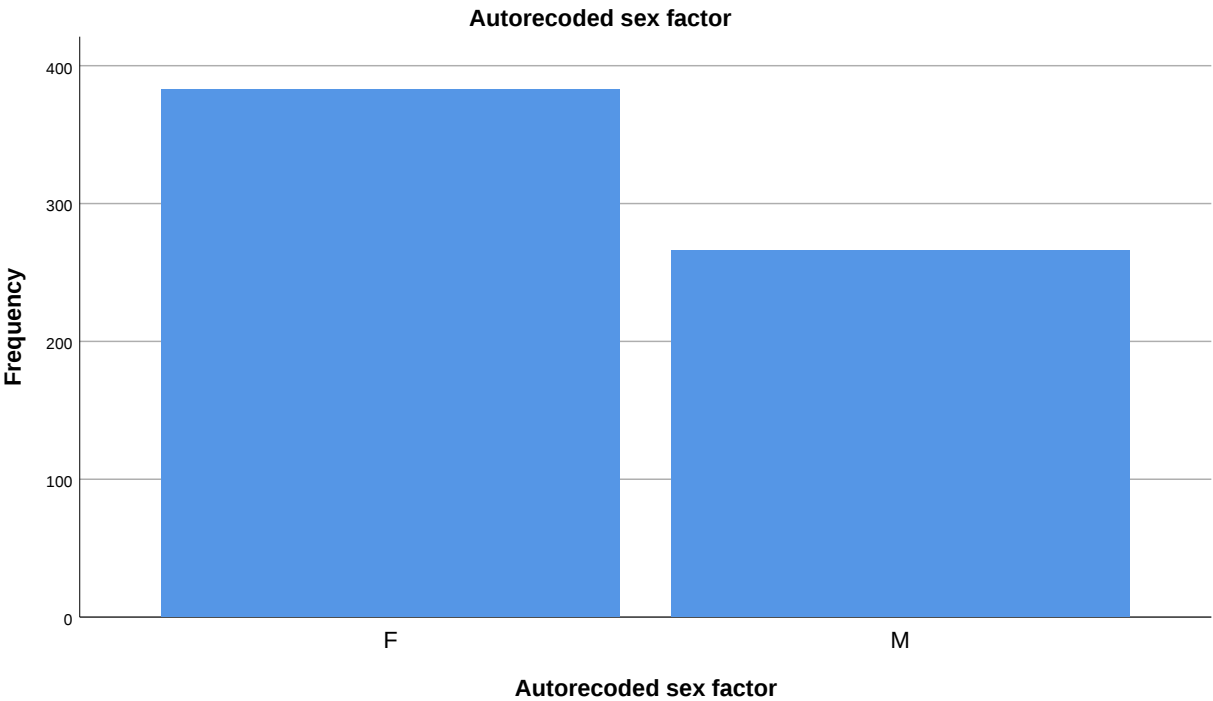
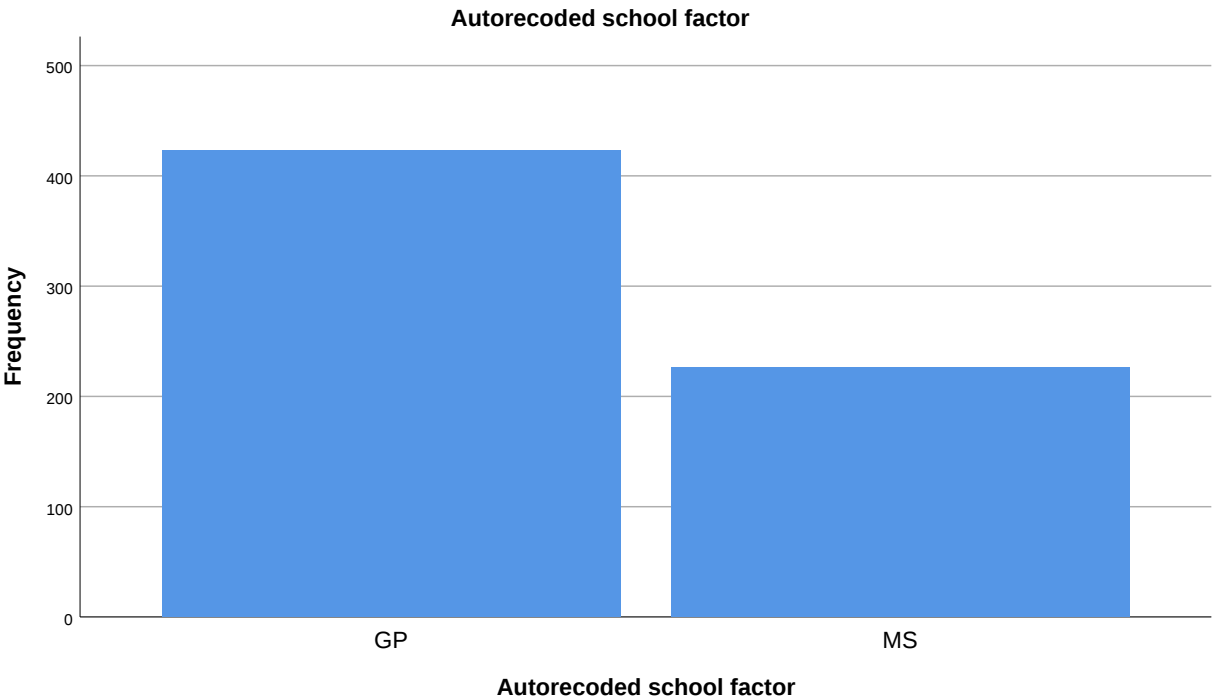
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	549	84.6	84.6	84.6
	1.00	70	10.8	10.8	95.4
	2.00	16	2.5	2.5	97.8
	3.00	14	2.2	2.2	100.0
	Total	649	100.0	100.0	

Bar Chart

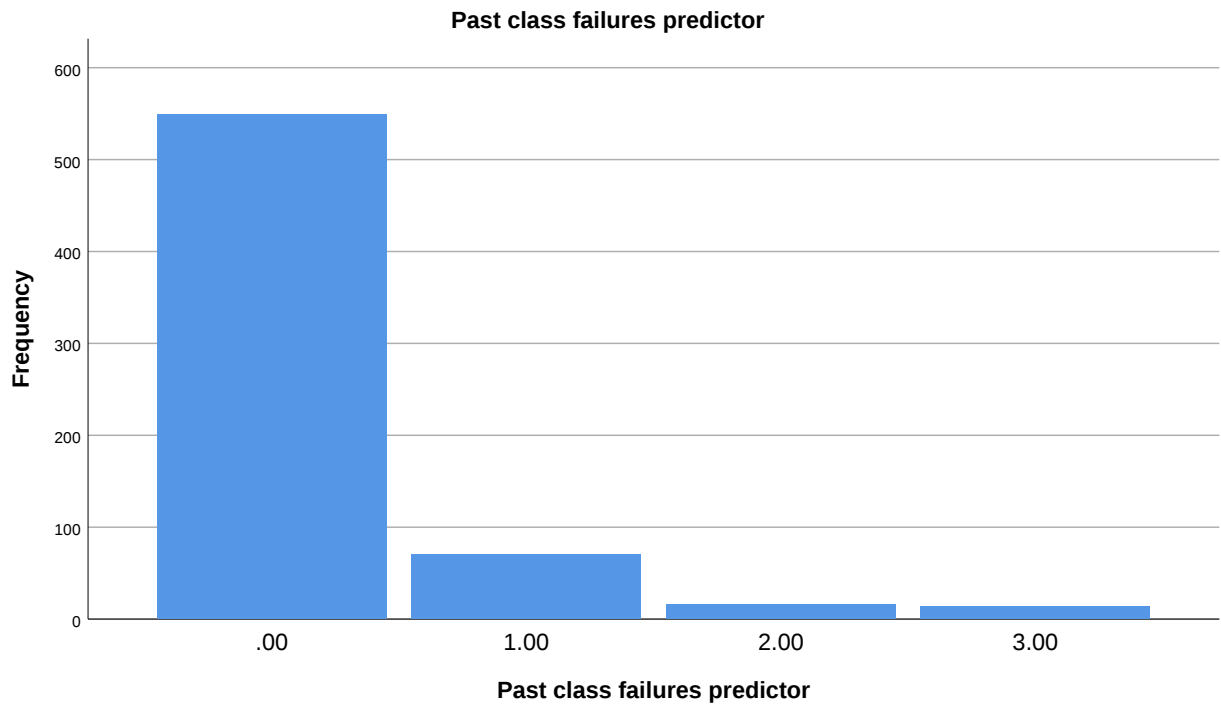
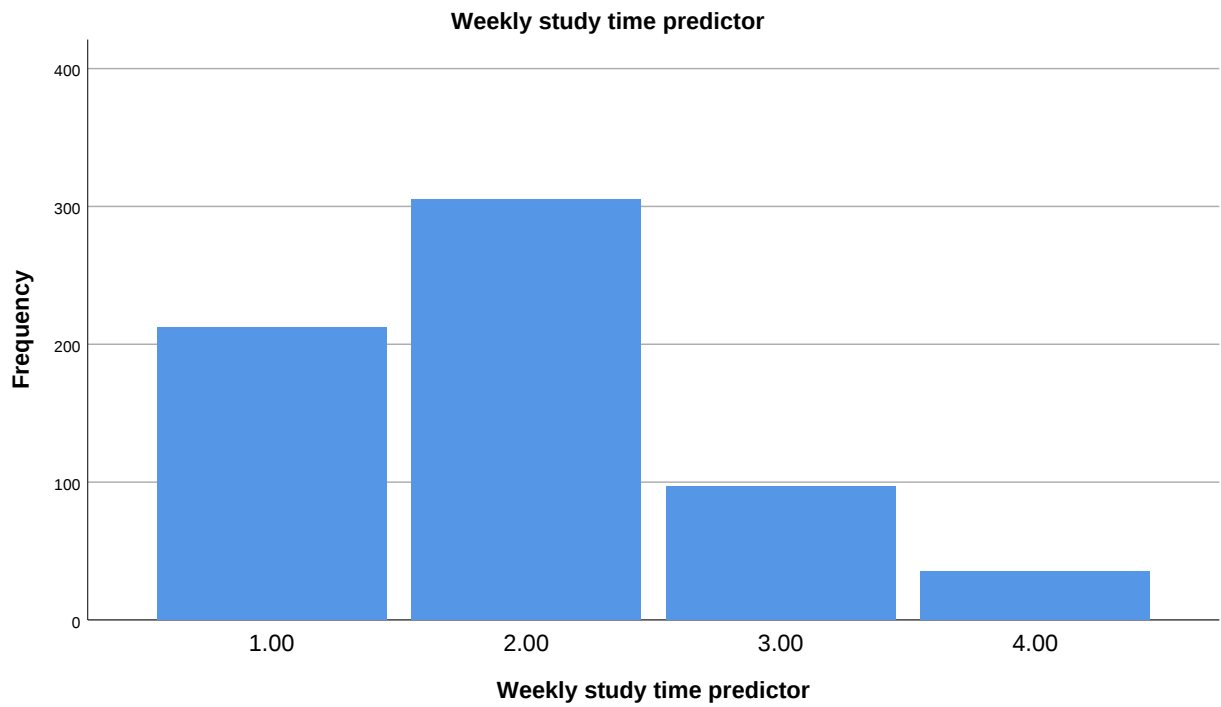
ZINBZero Frequency
Observed zero and positive count cases



ZINBZero Frequency
Observed zero and positive count cases



ZINBZero Frequency
Observed zero and positive count cases



ZINB Count Distribution

ZINB Count Distribution
Histogram of the absences count outcome

Explore

Notes

Output Created		12-JUL-2026 15:45:38
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\ sav\zero_inflated_negative _binomial_regression_sps s_ready_data.sav
	Active Dataset	ZINBRegressionData
	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 for dependent variables are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any dependent variable or factor used.
Syntax		EXAMINE VARIABLES=absences /PLOT HISTOGRAM BOXPLOT /STATISTICS DESCRIPTIVES /CINTERVAL 95 /MISSING LISTWISE /NOTOTAL.
Resources	Processor Time	00:00:01.84
	Elapsed Time	00:00:01.29

ZINB Count Distribution
Histogram of the absences count outcome

Case Processing Summary

	Valid		Cases Missing		Total	
	N	Percent	N	Percent	N	Percent
Count outcome: number of school absences	649	100.0%	0	0.0%	649	100.0%

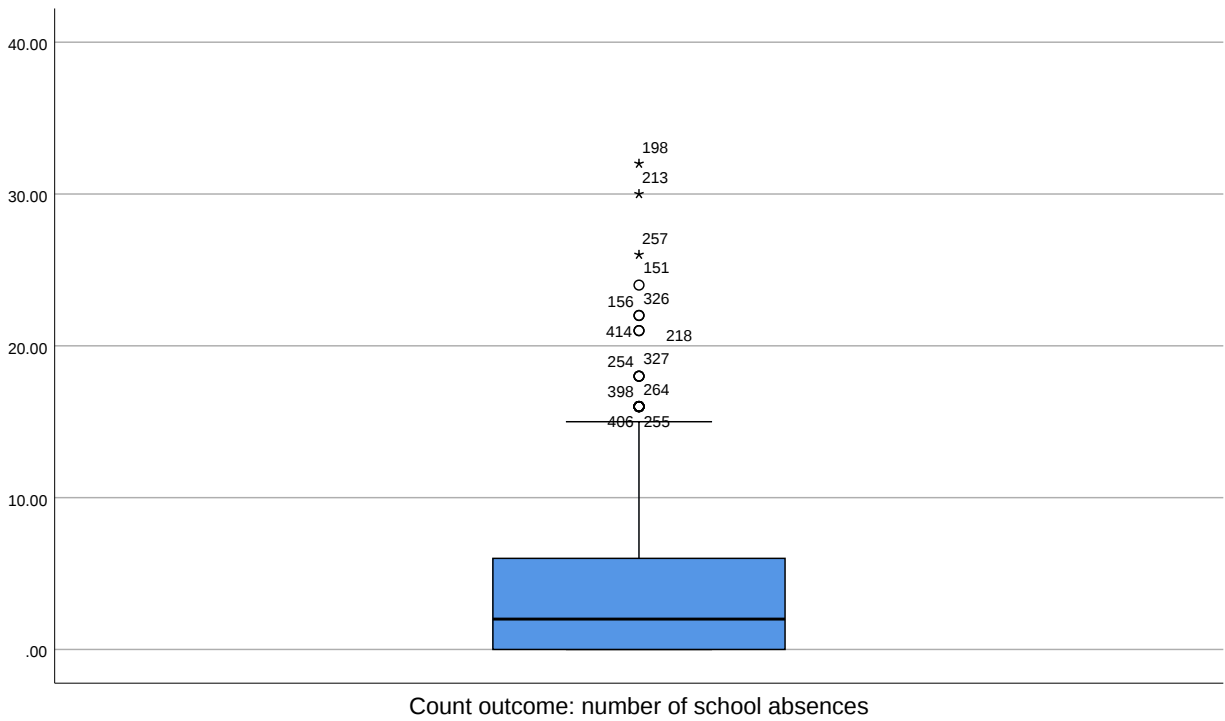
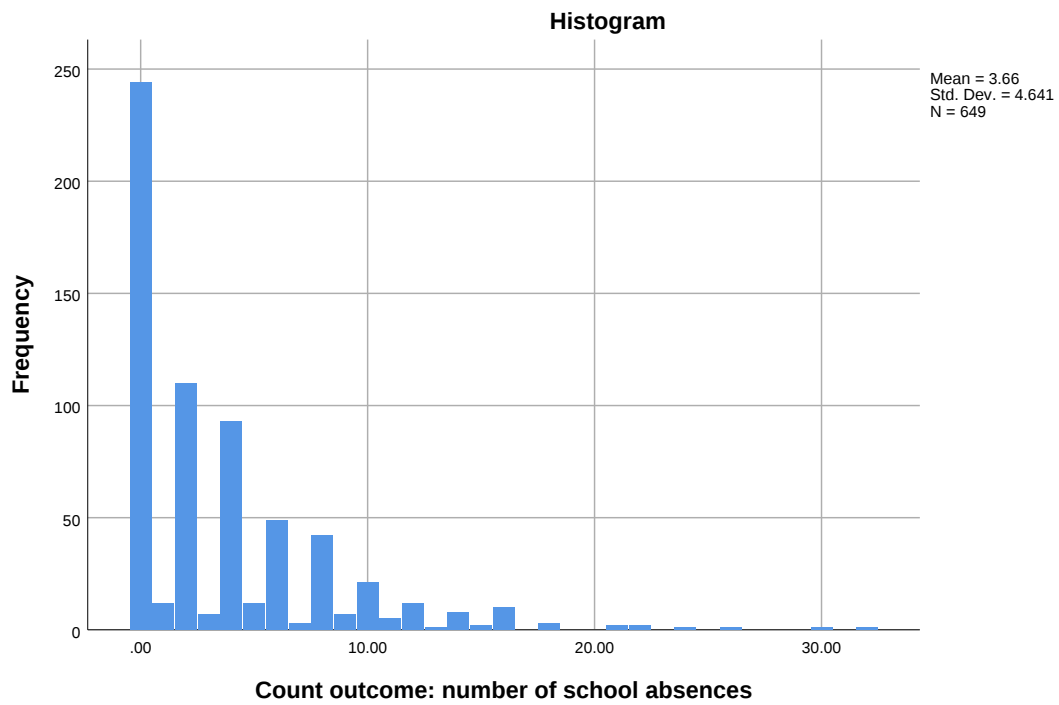
Descriptives

		Statistic	Std. Error
Count outcome: number of school absences	Mean	3.6595	.18217
	95% Confidence Interval for Mean	Lower Bound	3.3018
		Upper Bound	4.0172
	5% Trimmed Mean	3.0861	
	Median	2.0000	
	Variance	21.537	
	Std. Deviation	4.64076	
	Minimum	.00	
	Maximum	32.00	
	Range	32.00	
	Interquartile Range	6.00	
	Skewness	2.021	.096
	Kurtosis	5.781	.192

Count outcome: number of school absences

ZINBCount Distribution

Histogram of the absences count outcome



ZINBNegative Binomial Count Component

ZINBNegative Binomial Count Component
Log-link count model for absences

Generalized Linear Models

Notes

Output Created		12-JUL-2026 15:45:40
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\ sav\zero_inflated_negative _binomial_regression_sps s_ready_data.sav
	Active Dataset	ZINBRegressionData
	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 for factor, subject and within-subject variables are treated as missing.
	Cases Used	Statistics are based on cases with valid data for all variables in the model.
Weight Handling		not applicable

ZINBNegative Binomial Count Component
Log-link count model for absences

Notes

Syntax		GENLIN absences BY school_id sex_id WITH G1 G2 G3 age studytime failures /MODEL G1 G2 G3 age studytime failures school_id sex_id INTERCEPT=YES DISTRIBUTION=NEGBIN (MLE) LINK=LOG /CRITERIA METHOD=FISHER(1) COVB=MODEL MAXITERATIONS=100 MAXSTEPHALVING=5 PCONVERGE=1E-006 (ABSOLUTE) SINGULAR=1E-012 /PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.
Resources	Processor Time	00:00:00.27
	Elapsed Time	00:00:00.43

Model Information

Dependent Variable	Count outcome: number of school absences
Probability Distribution	Negative binomial (MLE)
Link Function	Log

Case Processing Summary

	N	Percent
Included	649	100.0%
Excluded	0	0.0%
Total	649	100.0%

ZINBNegative Binomial Count Component
Log-link count model for absences

Categorical Variable Information

			N	Percent
Factor	Autorecoded school factor	GP	423	65.2%
		MS	226	34.8%
		Total	649	100.0%
	Autorecoded sex factor	F	383	59.0%
		M	266	41.0%
		Total	649	100.0%

Continuous Variable Information

		N	Minimum	Maximum	Mean
Dependent Variable	Count outcome: number of school absences	649	.00	32.00	3.6595
Covariate	First period grade predictor	649	.00	19.00	11.3991
	Second period grade predictor	649	.00	19.00	11.5701
	Final grade predictor	649	.00	19.00	11.9060
	Student age predictor	649	15.00	22.00	16.7442
	Weekly study time predictor	649	1.00	4.00	1.9307
	Past class failures predictor	649	.00	3.00	.2219

Continuous Variable Information

		Std. Deviation
Dependent Variable	Count outcome: number of school absences	4.64076
Covariate	First period grade predictor	2.74527
	Second period grade predictor	2.91364
	Final grade predictor	3.23066
	Student age predictor	1.21814
	Weekly study time predictor	.82951
	Past class failures predictor	.59324

ZINBNegative Binomial Count Component
Log-link count model for absences

Goodness of Fit^a

	Value	df	Value/df
Deviance	710.708	639	1.112
Scaled Deviance	710.708	639	
Pearson Chi-Square	515.083	639	.806
Scaled Pearson Chi-Square	515.083	639	
Log Likelihood ^b	-1513.072		
Akaike's Information Criterion (AIC)	3046.144		
Finite Sample Corrected AIC (AICC)	3046.489		
Bayesian Information Criterion (BIC)	3090.898		
Consistent AIC (CAIC)	3100.898		

Dependent Variable: Count outcome: number of school absences

Model: (Intercept), First period grade predictor, Second period grade predictor, Final grade predictor, Student age predictor, Weekly study time predictor, Past class failures predictor, Autorecoded school factor, Autorecoded sex factor

a. Information criteria are in smaller-is-better form.

b. The full log likelihood function is displayed and used in computing information criteria.

ZINBNegative Binomial Count Component
Log-link count model for absences

Omnibus Test^a

Likelihood Ratio Chi-Square	df	Sig.
57.491	8	.000

Dependent Variable: Count outcome:
number of school absences
Model: (Intercept), First period grade
predictor, Second period grade
predictor, Final grade predictor, Student
age predictor, Weekly study time
predictor, Past class failures predictor,
Autorecoded school factor, Autorecoded
sex factor

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

Source	Wald Chi-Square	Type III	
		df	Sig.
(Intercept)	.804	1	.370
First period grade predictor	5.355	1	.021
Second period grade predictor	2.996	1	.083
Final grade predictor	4.329	1	.037
Student age predictor	4.579	1	.032
Weekly study time predictor	6.023	1	.014
Past class failures predictor	.160	1	.689
Autorecoded school factor	31.192	1	.000
Autorecoded sex factor	.061	1	.804

Dependent Variable: Count outcome: number of school absences
Model: (Intercept), First period grade predictor, Second period grade
predictor, Final grade predictor, Student age predictor, Weekly study
time predictor, Past class failures predictor, Autorecoded school
factor, Autorecoded sex factor

ZINBNegative Binomial Count Component
Log-link count model for absences

Parameter Estimates

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test
			Lower	Upper	Wald Chi-Square
(Intercept)	.401	.8375	-1.241	2.042	.229
First period grade predictor	-.105	.0452	-.193	-.016	5.355
Second period grade predictor	-.110	.0638	-.236	.015	2.996
Final grade predictor	.120	.0579	.007	.234	4.329
Student age predictor	.101	.0472	.008	.194	4.579
Weekly study time predictor	-.165	.0671	-.296	-.033	6.023
Past class failures predictor	.043	.1069	-.167	.252	.160
[Autorecoded school factor=1]	.682	.1222	.443	.922	31.192
[Autorecoded school factor=2]	0 ^a	.	.	.	.
[Autorecoded sex factor=1]	.028	.1139	-.195	.251	.061
[Autorecoded sex factor=2]	0 ^a	.	.	.	.
(Scale)	1 ^b				
(Negative binomial)	1.570	.1262	1.341	1.838	

ZINBNegative Binomial Count Component
Log-link count model for absences

Parameter Estimates

Parameter	Hypothesis Test	
	df	Sig.
(Intercept)	1	.632
First period grade predictor	1	.021
Second period grade predictor	1	.083
Final grade predictor	1	.037
Student age predictor	1	.032
Weekly study time predictor	1	.014
Past class failures predictor	1	.689
[Autorecoded school factor=1]	1	.000
[Autorecoded school factor=2]	.	.
[Autorecoded sex factor=1]	1	.804
[Autorecoded sex factor=2]	.	.
(Scale)		
(Negative binomial)		

Dependent Variable: Count outcome: number of school absences

Model: (Intercept), First period grade predictor, Second period grade predictor, Final grade predictor, Student age predictor, Weekly study time predictor, Past class failures predictor, Autorecoded school factor, Autorecoded sex factor

- a. Set to zero because this parameter is redundant.
- b. Fixed at the displayed value.

ZINBPoisson Comparison Model

ZINBPoisson Comparison Model
Poisson log-link comparison for the same count outcome

Generalized Linear Models

Notes

Output Created		12-JUL-2026 15:45:40
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\ sav\zero_inflated_negative _binomial_regression_sps s_ready_data.sav
	Active Dataset	ZINBRegressionData
	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 for factor, subject and within-subject variables are treated as missing.
	Cases Used	Statistics are based on cases with valid data for all variables in the model.
Weight Handling		not applicable

ZINBPoisson Comparison Model

Poisson log-link comparison for the same count outcome

Notes

Syntax	GENLIN absences BY school_id sex_id WITH G1 G2 G3 age studytime failures /MODEL G1 G2 G3 age studytime failures school_id sex_id INTERCEPT=YES DISTRIBUTION=POISSO N LINK=LOG /CRITERIA METHOD=FISHER(1) SCALE=PEARSON COVB=MODEL MAXITERATIONS=100 MAXSTEPHALVING=5 PCONVERGE=1E-006 (ABSOLUTE) SINGULAR=1E-012 /PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.	
Resources	Processor Time	00:00:00.23
	Elapsed Time	00:00:00.31

Model Information

Dependent Variable	Count outcome: number of school absences
Probability Distribution	Poisson
Link Function	Log

Case Processing Summary

	N	Percent
Included	649	100.0%
Excluded	0	0.0%
Total	649	100.0%

ZINBPoisson Comparison Model
Poisson log-link comparison for the same count outcome

Categorical Variable Information

			N	Percent
Factor	Autorecoded school factor	GP	423	65.2%
		MS	226	34.8%
		Total	649	100.0%
	Autorecoded sex factor	F	383	59.0%
		M	266	41.0%
		Total	649	100.0%

Continuous Variable Information

		N	Minimum	Maximum	Mean
Dependent Variable	Count outcome: number of school absences	649	.00	32.00	3.6595
Covariate	First period grade predictor	649	.00	19.00	11.3991
	Second period grade predictor	649	.00	19.00	11.5701
	Final grade predictor	649	.00	19.00	11.9060
	Student age predictor	649	15.00	22.00	16.7442
	Weekly study time predictor	649	1.00	4.00	1.9307
	Past class failures predictor	649	.00	3.00	.2219

Continuous Variable Information

		Std. Deviation
Dependent Variable	Count outcome: number of school absences	4.64076
Covariate	First period grade predictor	2.74527
	Second period grade predictor	2.91364
	Final grade predictor	3.23066
	Student age predictor	1.21814
	Weekly study time predictor	.82951
	Past class failures predictor	.59324

ZINBPoisson Comparison Model
Poisson log-link comparison for the same count outcome

Goodness of Fit^a

	Value	df	Value/df
Deviance	3070.332	640	4.797
Scaled Deviance	615.641	640	
Pearson Chi-Square	3191.816	640	4.987
Scaled Pearson Chi-Square	640.000	640	
Log Likelihood ^{b,c}	-2221.733		
Adjusted Log Likelihood ^d	-445.486		
Akaike's Information Criterion (AIC)	4461.466		
Finite Sample Corrected AIC (AICC)	4461.747		
Bayesian Information Criterion (BIC)	4501.744		
Consistent AIC (CAIC)	4510.744		

Dependent Variable: Count outcome: number of school absences

Model: (Intercept), First period grade predictor, Second period grade predictor, Final grade predictor, Student age predictor, Weekly study time predictor, Past class failures predictor, Autorecoded school factor, Autorecoded sex factor

- a. Information criteria are in smaller-is-better form.
- b. The full log likelihood function is displayed and used in computing information criteria.
- c. The log likelihood is based on a scale parameter fixed at 1.
- d. The adjusted log likelihood is based on an estimated scale parameter and is used in the model fitting omnibus test.

ZINBPoisson Comparison Model
Poisson log-link comparison for the same count outcome

Omnibus Test^a

Likelihood Ratio Chi-Square	df	Sig.
79.081	8	.000

Dependent Variable: Count outcome:
number of school absences
Model: (Intercept), First period grade
predictor, Second period grade
predictor, Final grade predictor, Student
age predictor, Weekly study time
predictor, Past class failures predictor,
Autorecoded school factor, Autorecoded
sex factor

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

Source	Wald Chi-Square	Type III	
		df	Sig.
(Intercept)	.175	1	.675
First period grade predictor	4.807	1	.028
Second period grade predictor	2.345	1	.126
Final grade predictor	2.359	1	.125
Student age predictor	10.068	1	.002
Weekly study time predictor	8.826	1	.003
Past class failures predictor	.309	1	.578
Autorecoded school factor	36.197	1	.000
Autorecoded sex factor	.828	1	.363

Dependent Variable: Count outcome: number of school absences
Model: (Intercept), First period grade predictor, Second period grade
predictor, Final grade predictor, Student age predictor, Weekly study
time predictor, Past class failures predictor, Autorecoded school
factor, Autorecoded sex factor

ZINBPoisson Comparison Model
Poisson log-link comparison for the same count outcome

Parameter Estimates

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test
			Lower	Upper	Wald Chi-Square
(Intercept)	-.091	.6989	-1.461	1.279	.017
First period grade predictor	-.069	.0316	-.131	-.007	4.807
Second period grade predictor	-.069	.0448	-.157	.019	2.345
Final grade predictor	.058	.0381	-.016	.133	2.359
Student age predictor	.123	.0386	.047	.198	10.068
Weekly study time predictor	-.189	.0636	-.314	-.064	8.826
Past class failures predictor	.042	.0756	-.106	.190	.309
[Autorecoded school factor=1]	.682	.1133	.460	.904	36.197
[Autorecoded school factor=2]	0 ^a	.	.	.	.
[Autorecoded sex factor=1]	.088	.0972	-.102	.279	.828
[Autorecoded sex factor=2]	0 ^a	.	.	.	.
(Scale)	4.987 ^b				

ZINBPoisson Comparison Model
Poisson log-link comparison for the same count outcome

Parameter Estimates

Parameter	Hypothesis Test	
	df	Sig.
(Intercept)	1	.896
First period grade predictor	1	.028
Second period grade predictor	1	.126
Final grade predictor	1	.125
Student age predictor	1	.002
Weekly study time predictor	1	.003
Past class failures predictor	1	.578
[Autorecoded school factor=1]	1	.000
[Autorecoded school factor=2]	.	.
[Autorecoded sex factor=1]	1	.363
[Autorecoded sex factor=2]	.	.
(Scale)		

Dependent Variable: Count outcome: number of school absences

Model: (Intercept), First period grade predictor, Second period grade predictor, Final grade predictor, Student age predictor, Weekly study time predictor, Past class failures predictor, Autorecoded school factor, Autorecoded sex factor

- a. Set to zero because this parameter is redundant.
- b. Computed based on the Pearson chi-square.

ZINBLogistic Zero Component

ZINB Logistic Zero Component
Logistic model for the probability that absences equals zero

Logistic Regression

Notes

Output Created		12-JUL-2026 15:45:40
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\ sav\zero_inflated_negative _binomial_regression_sps s_ready_data.sav
	Active Dataset	ZINBRegressionData
	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
Syntax		LOGISTIC REGRESSION VARIABLES absences_zero /METHOD=ENTER G1 G2 G3 age studytime failures school_id sex_id /CATEGORICAL=school_i d sex_id /CONTRAST (school_id) =Indicator /CONTRAST (sex_id) =Indicator /PRINT=CI(95) GOODFIT /CRITERIA=PIN(.05) POUT(.10) ITERATE(100) CUT(.5) /SAVE=PRED (Predicted_Zero_Probabilit...
Resources	Processor Time	00:00:00.05
	Elapsed Time	00:00:00.07

ZINBLogistic Zero Component
Logistic model for the probability that absences equals zero

Notes

Variables Created or Modified	Predicted_Zero_Probability	Predicted probability
-------------------------------	----------------------------	-----------------------

Case Processing Summary

Unweighted Cases ^a		N	Percent
Selected Cases	Included in Analysis	649	100.0
	Missing Cases	0	.0
	Total	649	100.0
Unselected Cases		0	.0
Total		649	100.0

a. If weight is in effect, see classification table for the total number of cases.

**Dependent Variable
Encoding**

Original Value	Internal Value
Positive count	0
Zero count	1

Categorical Variables Codings

		Frequency	Parameter coding (1)
Autorecoded sex factor	F	383	1.000
	M	266	.000
Autorecoded school factor	GP	423	1.000
	MS	226	.000

Block 0: Beginning Block

ZINB Logistic Zero Component
Logistic model for the probability that absences equals zero

Classification Table^{a,b}

Observed			Predicted		Percentage Correct
			Zero-process indicator: 1 when absences equals zero	Zero count	
Step 0	Zero-process indicator: 1 when absences equals zero	Positive count	405	0	100.0
		Zero count	244	0	.0
	Overall Percentage				62.4

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.507	.081	39.096	1	.000	.602

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	First period grade predictor	12.490	1	.000
		Second period grade predictor	5.584	1	.018
		Final grade predictor	.684	1	.408
		Student age predictor	3.374	1	.066
		Weekly study time predictor	3.069	1	.080
		Past class failures predictor	3.226	1	.072
		Autorecoded school factor (1)	4.915	1	.027
		Autorecoded sex factor(1)	.108	1	.743
Overall Statistics			43.824	8	.000

Block 1: Method = Enter

ZINB Logistic Zero Component
Logistic model for the probability that absences equals zero

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	45.721	8	.000
	Block	45.721	8	.000
	Model	45.721	8	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	813.624 ^a	.068	.093

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	8.639	8	.374

Contingency Table for Hosmer and Lemeshow Test

		Zero-process indicator: 1 when absences equals zero = Positive count		Zero-process indicator: 1 when absences equals zero = Zero count		Total
		Observed	Expected	Observed	Expected	
Step 1	1	51	53.293	14	11.707	65
	2	49	49.435	16	15.565	65
	3	43	46.562	22	18.438	65
	4	42	44.690	24	21.310	66
	5	49	41.870	16	23.130	65
	6	46	40.577	20	25.423	66
	7	38	37.843	27	27.157	65
	8	37	35.466	28	29.534	65
	9	31	32.380	35	33.620	66
	10	19	22.885	42	38.115	61

ZINB Logistic Zero Component
Logistic model for the probability that absences equals zero

Classification Table^a

Observed			Predicted		Percentage Correct
			Zero-process indicator: 1 when absences equals zero	Zero count	
Step 1	Zero-process indicator: 1 when absences equals zero	Positive count	369	36	91.1
		Zero count	179	65	26.6
	Overall Percentage				66.9

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.
Step 1 ^a	First period grade predictor	.239	.067	12.553	1	.000
	Second period grade predictor	.150	.087	2.945	1	.086
	Final grade predictor	-.263	.074	12.606	1	.000
	Student age predictor	-.080	.075	1.141	1	.286
	Weekly study time predictor	.162	.106	2.333	1	.127
	Past class failures predictor	-.116	.178	.423	1	.515
	Autorecoded school factor (1)	-.628	.187	11.232	1	.001
	Autorecoded sex factor(1)	-.182	.177	1.056	1	.304
	Constant	-.298	1.313	.052	1	.820

ZINBLogistic Zero Component
Logistic model for the probability that absences equals zero

Variables in the Equation

		Exp(B)	95% C.I. for EXP(B)	
			Lower	Upper
Step 1 ^a	First period grade predictor	1.270	1.113	1.449
	Second period grade predictor	1.162	.979	1.379
	Final grade predictor	.769	.665	.889
	Student age predictor	.923	.797	1.069
	Weekly study time predictor	1.176	.955	1.447
	Past class failures predictor	.891	.629	1.262
	Autorecoded school factor (1)	.533	.369	.770
	Autorecoded sex factor(1)	.834	.590	1.179
	Constant	.742		

- a. Variable(s) entered on step 1: First period grade predictor, Second period grade predictor, Final grade predictor, Student age predictor, Weekly study time predictor, Past class failures predictor, Autorecoded school factor, Autorecoded sex factor.

ZINB Zero-Probability Diagnostics

ZINBZero-Probability Diagnostics
Saved logistic probability of a zero count

Descriptives

Notes

Output Created		12-JUL-2026 15:45:41
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\ sav\zero_inflated_negative _binomial_regression_sps s_ready_data.sav
	Active Dataset	ZINBRegressionData
	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=Predicted_Z ero_Probability /STATISTICS=MEAN STDDEV MIN MAX.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.01

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Predicted probability	649	.03020	.84607	.3759630	.12694066
Valid N (listwise)	649				

Explore

ZINBZero-Probability Diagnostics
Saved logistic probability of a zero count

Notes

Output Created		12-JUL-2026 15:45:41
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\ sav\zero_inflated_negative _binomial_regression_sps s_ready_data.sav
	Active Dataset	ZINBRegressionData
	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 for dependent variables are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any dependent variable or factor used.
Syntax		EXAMINE VARIABLES=Predicted_Z ero_Probability BY absences_zero /PLOT BOXPLOT /STATISTICS DESCRIPTIVES /CINTERVAL 95 /MISSING LISTWISE /NOTOTAL.
Resources	Processor Time	00:00:00.44
	Elapsed Time	00:00:00.47

Zero-process indicator: 1 when absences equals zero

ZINBZero-Probability Diagnostics
Saved logistic probability of a zero count

Case Processing Summary

		Cases			
Zero-process indicator: 1 when absences equals zero		Valid		Missing	
		N	Percent	N	Percent
Predicted probability	Positive count	405	100.0%	0	0.0%
	Zero count	244	100.0%	0	0.0%

Case Processing Summary

		Cases	
Zero-process indicator: 1 when absences equals zero		Total	
		N	Percent
Predicted probability	Positive count	405	100.0%
	Zero count	244	100.0%

Descriptives

Zero-process indicator: 1 when absences equals zero			Statistic
Predicted probability	Positive count	Mean	.3495889
		95% Confidence Interval for Mean	Lower Bound
			Upper Bound
		5% Trimmed Mean	.3467664
		Median	.3486548
		Variance	.012
		Std. Deviation	.11165636
		Minimum	.03020
		Maximum	.66138
		Range	.63118
		Interquartile Range	.16246
		Skewness	.268
		Kurtosis	-.224
	Zero count	Mean	.4197398
		95% Confidence Interval for Mean	Lower Bound
			Upper Bound
		5% Trimmed Mean	.4153451
		Median	.4127402
		Variance	.019

ZINBZero-Probability Diagnostics
Saved logistic probability of a zero count

Descriptives

Zero-process indicator: 1 when absences equals zero			Std. Error
Predicted probability	Positive count	Mean	.00554825
		95% Confidence Interval for Mean	Lower Bound
			Upper Bound
		5% Trimmed Mean	
		Median	
		Variance	
		Std. Deviation	
		Minimum	
		Maximum	
		Range	
		Interquartile Range	
		Skewness	.121
		Kurtosis	.242
	Zero count	Mean	.00886132
		95% Confidence Interval for Mean	Lower Bound
			Upper Bound
		5% Trimmed Mean	
		Median	
		Variance	

Descriptives

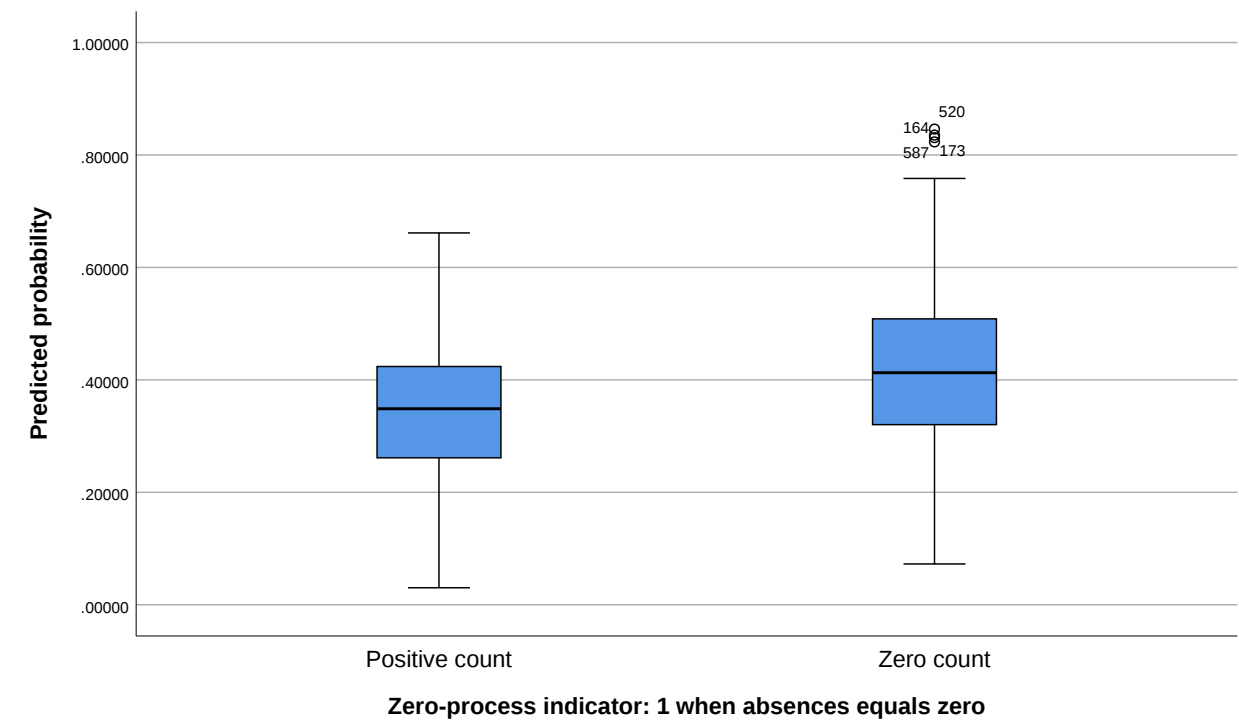
Zero-process indicator: 1 when absences equals zero		Statistic
	Std. Deviation	.13841821
	Minimum	.07251
	Maximum	.84607
	Range	.77356
	Interquartile Range	.18905
	Skewness	.458
	Kurtosis	.381

ZINBZero-Probability Diagnostics
Saved logistic probability of a zero count

Descriptives

Zero-process indicator: 1 when absences equals zero		Std. Error
	Std. Deviation	
	Minimum	
	Maximum	
	Range	
	Interquartile Range	
	Skewness	.156
	Kurtosis	.310

Predicted probability



Means

ZINBZero-Probability Diagnostics
Saved logistic probability of a zero count

Notes

Output Created		12-JUL-2026 15:45:41
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Zero Inflated Negative Binomial Regression\SPSS_Output\ sav\zero_inflated_negative _binomial_regression_sps s_ready_data.sav
	Active Dataset	ZINBRegressionData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Missing Value Handling	Definition of Missing	For each dependent variable in a table, user- defined missing values for the dependent and all grouping variables are treated as missing.
	Cases Used	Cases used for each table have no missing values in any independent variable, and not all dependent variables have missing values.
Syntax		MEANS TABLES=absences BY studytime BY failures /CELLS=COUNT MEAN STDDEV MIN MAX.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.02

ZINBZero-Probability Diagnostics
Saved logistic probability of a zero count

Case Processing Summary

	Included		Cases Excluded		Total	
	N	Percent	N	Percent	N	Percent
Count outcome: number of school absences * Weekly study time predictor * Past class failures predictor	649	100.0%	0	0.0%	649	100.0%

Report

Count outcome: number of school absences

Weekly study time predictor	Past class failures predictor	N	Mean	Std. Deviation	Minimum
1.00	.00	163	4.0429	4.43241	.00
	1.00	36	5.6389	7.31790	.00
	2.00	4	1.0000	2.00000	.00
	3.00	9	6.0000	4.89898	.00
	Total	212	4.3396	5.06149	.00
2.00	.00	264	3.2538	4.56803	.00
	1.00	26	6.4231	5.33046	.00
	2.00	10	5.1000	6.34998	.00
	3.00	5	4.2000	4.91935	.00
	Total	305	3.6000	4.77149	.00
3.00	.00	89	2.4831	3.21966	.00
	1.00	6	4.5000	5.20577	.00
	2.00	2	3.0000	4.24264	.00
	Total	97	2.6186	3.36787	.00
4.00	.00	33	3.0606	3.10181	.00
	1.00	2	1.0000	1.41421	.00
	Total	35	2.9429	3.05771	.00
Total	.00	549	3.3515	4.28057	.00
	1.00	70	5.7000	6.35735	.00
	2.00	16	3.8125	5.43101	.00
	3.00	14	5.3571	4.79755	.00
	Total	649	3.6595	4.64076	.00

ZINBZero-Probability Diagnostics
Saved logistic probability of a zero count

Report

Count outcome: number of school absences

Weekly study time predictor	Past class failures predictor	Maximum
1.00	.00	22.00
	1.00	30.00
	2.00	4.00
	3.00	14.00
	Total	30.00
2.00	.00	32.00
	1.00	18.00
	2.00	21.00
	3.00	10.00
	Total	32.00
3.00	.00	12.00
	1.00	14.00
	2.00	6.00
	Total	14.00
4.00	.00	10.00
	1.00	2.00
	Total	10.00
Total	.00	32.00
	1.00	30.00
	2.00	21.00
	3.00	14.00
	Total	32.00