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Multicollinearity Check

Multicollinearity Check
Import data

Predictor correlation matrix

Predictor correlation matrix
Pairwise predictor redundancy check

Correlations

[MulticollinearityData] D:\DATA ANALYSIS\B Normality and Assumption Tests\Multicollinearity Check\SPSS_Output\sav\Multicollinearity-Check-data.sav

Correlations

		G1	G2	studytime	failures	absences	age
G1	Pearson Correlation	1	.865**	.261**	-.384**	-.147**	-.174**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	649	649	649	649	649	649
G2	Pearson Correlation	.865**	1	.240**	-.386**	-.125**	-.107**
	Sig. (2-tailed)	.000		.000	.000	.001	.006
	N	649	649	649	649	649	649
studytime	Pearson Correlation	.261**	.240**	1	-.147**	-.118**	-.008
	Sig. (2-tailed)	.000	.000		.000	.003	.831
	N	649	649	649	649	649	649
failures	Pearson Correlation	-.384**	-.386**	-.147**	1	.123**	.320**
	Sig. (2-tailed)	.000	.000	.000		.002	.000
	N	649	649	649	649	649	649
absences	Pearson Correlation	-.147**	-.125**	-.118**	.123**	1	.150**
	Sig. (2-tailed)	.000	.001	.003	.002		.000
	N	649	649	649	649	649	649
age	Pearson Correlation	-.174**	-.107**	-.008	.320**	.150**	1
	Sig. (2-tailed)	.000	.006	.831	.000	.000	
	N	649	649	649	649	649	649
Medu	Pearson Correlation	.260**	.264**	.097*	-.172**	-.009	-.108**
	Sig. (2-tailed)	.000	.000	.013	.000	.827	.006
	N	649	649	649	649	649	649
Fedu	Pearson Correlation	.218**	.225**	.050	-.166**	.030	-.121**
	Sig. (2-tailed)	.000	.000	.200	.000	.448	.002
	N	649	649	649	649	649	649
traveltime	Pearson Correlation	-.154**	-.154**	-.063	.098*	-.008	.034
	Sig. (2-tailed)	.000	.000	.108	.013	.836	.380
	N	649	649	649	649	649	649

Predictor correlation matrix
Pairwise predictor redundancy check

Correlations

		Medu	Fedu	traveltime
G1	Pearson Correlation	.260**	.218**	-.154**
	Sig. (2-tailed)	.000	.000	.000
	N	649	649	649
G2	Pearson Correlation	.264**	.225**	-.154**
	Sig. (2-tailed)	.000	.000	.000
	N	649	649	649
studytime	Pearson Correlation	.097*	.050	-.063
	Sig. (2-tailed)	.013	.200	.108
	N	649	649	649
failures	Pearson Correlation	-.172**	-.166**	.098*
	Sig. (2-tailed)	.000	.000	.013
	N	649	649	649
absences	Pearson Correlation	-.009	.030	-.008
	Sig. (2-tailed)	.827	.448	.836
	N	649	649	649
age	Pearson Correlation	-.108**	-.121**	.034
	Sig. (2-tailed)	.006	.002	.380
	N	649	649	649
Medu	Pearson Correlation	1	.647**	-.265**
	Sig. (2-tailed)		.000	.000
	N	649	649	649
Fedu	Pearson Correlation	.647**	1	-.208**
	Sig. (2-tailed)	.000		.000
	N	649	649	649
traveltime	Pearson Correlation	-.265**	-.208**	1
	Sig. (2-tailed)	.000	.000	
	N	649	649	649

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

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>Warning # 2003.  Command name: TITLE
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Predictor correlation matrix
Pairwise predictor redundancy check

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>The title given exceeds 60 characters in length.  The first 60 characters wil
l
>be used.
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Multicollinearity check using regression collinearity diagno

Multicollinearity check using regression collinearity diagno
Tolerance, VIF, eigenvalues, condition indices

Regression

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	traveltime, absences, studytime, age, Fedu, G2, failures, Medu, G1[b]	.	Enter

a. Dependent Variable: G3

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.923[a]	.851	.849	1.255

a. Predictors: (Constant), traveltime, absences, studytime, age, Fedu, G2, failures, Medu, G1

b. Dependent Variable: G3

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5756.426	9	639.603	405.929	.000[b]
	Residual	1006.841	639	1.576		
	Total	6763.267	648			

a. Dependent Variable: G3

b. Predictors: (Constant), traveltime, absences, studytime, age, Fedu, G2, failures, Medu, G1

Multicollinearity check using regression collinearity diagno
Tolerance, VIF, eigenvalues, condition indices

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics
		B	Std. Error	Beta	t	Sig.	Tolerance
1	(Constant)	-.705	.791		-.891	.373	
	G1	.145	.037	.123	3.942	.000	.240
	G2	.886	.034	.799	25.773	.000	.243
	studytime	.098	.062	.025	1.579	.115	.917
	failures	-.238	.095	-.044	-2.499	.013	.762
	absences	.023	.011	.033	2.114	.035	.947
	age	.023	.044	.009	.533	.594	.860
	Medu	-.034	.059	-.012	-.572	.567	.549
	Fedu	.025	.059	.009	.423	.673	.571
	traveltime	.085	.069	.020	1.232	.218	.918

Coefficients[a]

Model		Collinearity Statistics
		VIF
1	(Constant)	
	G1	4.167
	G2	4.122
	studytime	1.090
	failures	1.312
	absences	1.056
	age	1.163
	Medu	1.821
	Fedu	1.752
	traveltime	1.089

a. Dependent Variable: G3

Multicollinearity check using regression collinearity diagno
Tolerance, VIF, eigenvalues, condition indices

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions (Constant)	G1	G2	studytime
1	1	7.842	1.000	.00	.00	.00	.00
	2	.948	2.876	.00	.00	.00	.00
	3	.574	3.697	.00	.00	.00	.00
	4	.273	5.355	.00	.00	.00	.01
	5	.159	7.016	.00	.00	.00	.43
	6	.097	8.982	.00	.02	.03	.53
	7	.061	11.342	.00	.00	.00	.00
	8	.036	14.772	.03	.05	.06	.02
	9	.008	31.786	.00	.87	.88	.00
	10	.002	60.348	.96	.06	.02	.00

Collinearity Diagnostics[a]

Model	Dimension	Variance Proportions failures	absences	age	Medu	Fedu	traveltime
1	1	.00	.00	.00	.00	.00	.00
	2	.61	.04	.00	.00	.00	.00
	3	.10	.88	.00	.00	.00	.00
	4	.06	.00	.00	.08	.10	.27
	5	.01	.01	.00	.02	.08	.33
	6	.00	.00	.00	.02	.08	.16
	7	.00	.00	.00	.86	.73	.01
	8	.17	.04	.05	.01	.00	.20
	9	.00	.00	.00	.00	.00	.00
	10	.04	.00	.95	.00	.01	.01

a. Dependent Variable: G3

Multicollinearity check using regression collinearity diagno
Tolerance, VIF, eigenvalues, condition indices

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	.19	19.60	11.91	2.980	649
Residual	-8.986	5.603	.000	1.247	649
Std. Predicted Value	-3.932	2.583	.000	1.000	649
Std. Residual	-7.159	4.464	.000	.993	649

a. Dependent Variable: G3

Regression residual context

Regression residual context
Model used for multicollinearity diagnostics

Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
G3	649	0	19	11.91	3.231
pred_G3	649	.18625	19.60458	11.9060092	2.98049883
resid_G3	649	-8.98609	5.60290	.0000000	1.24650169
G1	649	0	19	11.40	2.745
G2	649	0	19	11.57	2.914
studytime	649	1	4	1.93	.830
failures	649	0	3	.22	.593
absences	649	0	32	3.66	4.641
age	649	15	22	16.74	1.218
Medu	649	0	4	2.51	1.135
Fedu	649	0	4	2.31	1.100
traveltime	649	1	4	1.57	.749
Valid N (listwise)	649				

Predictor descriptive statistics

Predictor descriptive statistics
Variables used in collinearity check

Explore

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
G1	649	100.0%	0	0.0%	649	100.0%
G2	649	100.0%	0	0.0%	649	100.0%
studytime	649	100.0%	0	0.0%	649	100.0%
failures	649	100.0%	0	0.0%	649	100.0%
absences	649	100.0%	0	0.0%	649	100.0%
age	649	100.0%	0	0.0%	649	100.0%
Medu	649	100.0%	0	0.0%	649	100.0%
Fedu	649	100.0%	0	0.0%	649	100.0%
traveltime	649	100.0%	0	0.0%	649	100.0%

Descriptives

			Statistic	Std. Error
G1	Mean		11.40	.108
	95% Confidence Interval for Mean	Lower Bound	11.19	
		Upper Bound	11.61	
	5% Trimmed Mean		11.39	
	Median		11.00	
	Variance		7.536	
	Std. Deviation		2.745	
	Minimum		0	
	Maximum		19	
	Range		19	
	Interquartile Range		3	
	Skewness		-.003	.096
	Kurtosis		.037	.192
G2	Mean		11.57	.114
	95% Confidence Interval for Mean	Lower Bound	11.35	
		Upper Bound	11.79	
	5% Trimmed Mean		11.60	

Predictor descriptive statistics
Variables used in collinearity check

Descriptives

			Statistic	Std. Error
	Median		11.00	
	Variance		8.489	
	Std. Deviation		2.914	
	Minimum		0	
	Maximum		19	
	Range		19	
	Interquartile Range		3	
	Skewness		-.360	.096
	Kurtosis		1.662	.192
studytime	Mean		1.93	.033
	95% Confidence Interval for Mean	Lower Bound	1.87	
		Upper Bound	1.99	
	5% Trimmed Mean		1.87	
	Median		2.00	
	Variance		.688	
	Std. Deviation		.830	
	Minimum		1	
	Maximum		4	
	Range		3	
	Interquartile Range		1	
	Skewness		.700	.096
	Kurtosis		.038	.192
failures	Mean		.22	.023
	95% Confidence Interval for Mean	Lower Bound	.18	
		Upper Bound	.27	
	5% Trimmed Mean		.12	
	Median		.00	
	Variance		.352	
	Std. Deviation		.593	
	Minimum		0	
	Maximum		3	
	Range		3	

Predictor descriptive statistics
Variables used in collinearity check

Descriptives

			Statistic	Std. Error
	Interquartile Range		0	
	Skewness		3.093	.096
	Kurtosis		9.824	.192
absences	Mean		3.66	.182
	95% Confidence Interval for Mean	Lower Bound	3.30	
		Upper Bound	4.02	
	5% Trimmed Mean		3.09	
	Median		2.00	
	Variance		21.537	
	Std. Deviation		4.641	
	Minimum		0	
	Maximum		32	
	Range		32	
	Interquartile Range		6	
	Skewness		2.021	.096
	Kurtosis		5.781	.192
age	Mean		16.74	.048
	95% Confidence Interval for Mean	Lower Bound	16.65	
		Upper Bound	16.84	
	5% Trimmed Mean		16.69	
	Median		17.00	
	Variance		1.484	
	Std. Deviation		1.218	
	Minimum		15	
	Maximum		22	
	Range		7	
	Interquartile Range		2	
	Skewness		.417	.096
	Kurtosis		.072	.192
Medu	Mean		2.51	.045
	95% Confidence Interval for Mean	Lower Bound	2.43	
		Upper Bound	2.60	

Predictor descriptive statistics
Variables used in collinearity check

Descriptives

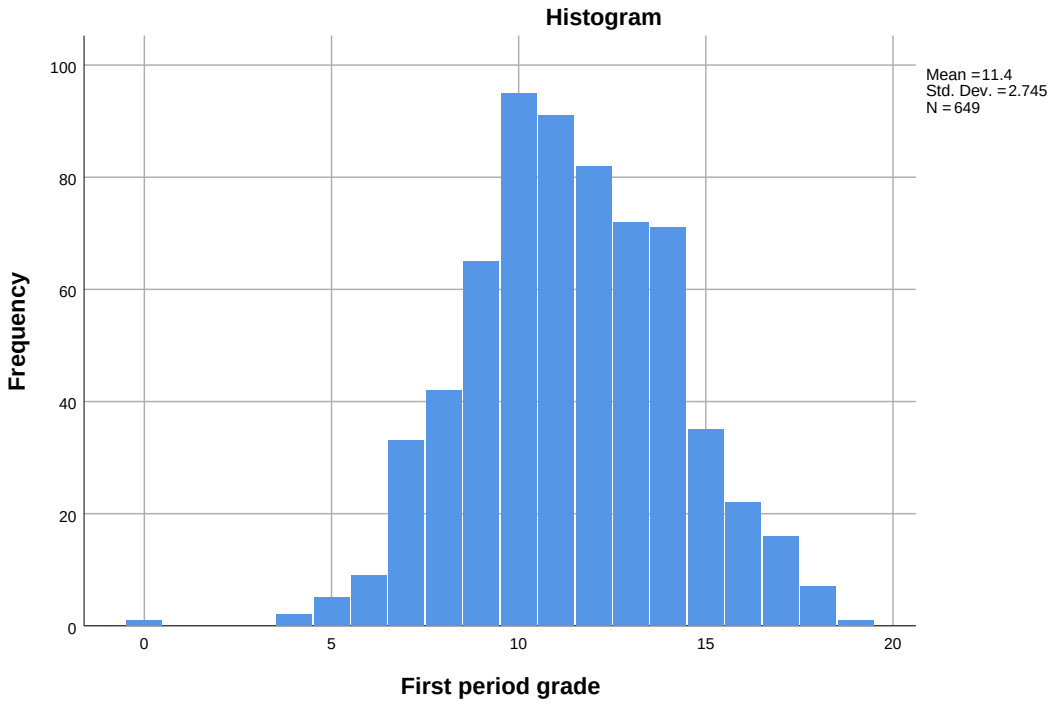
			Statistic	Std. Error
	5% Trimmed Mean		2.53	
	Median		2.00	
	Variance		1.287	
	Std. Deviation		1.135	
	Minimum		0	
	Maximum		4	
	Range		4	
	Interquartile Range		2	
	Skewness		-.030	.096
	Kurtosis		-1.261	.192
Fedu	Mean		2.31	.043
	95% Confidence Interval for Mean	Lower Bound	2.22	
		Upper Bound	2.39	
	5% Trimmed Mean		2.30	
	Median		2.00	
	Variance		1.210	
	Std. Deviation		1.100	
	Minimum		0	
	Maximum		4	
	Range		4	
	Interquartile Range		2	
	Skewness		.215	.096
	Kurtosis		-1.109	.192
traveltime	Mean		1.57	.029
	95% Confidence Interval for Mean	Lower Bound	1.51	
		Upper Bound	1.63	
	5% Trimmed Mean		1.49	
	Median		1.00	
	Variance		.560	
	Std. Deviation		.749	
	Minimum		1	
	Maximum		4	

Predictor descriptive statistics
Variables used in collinearity check

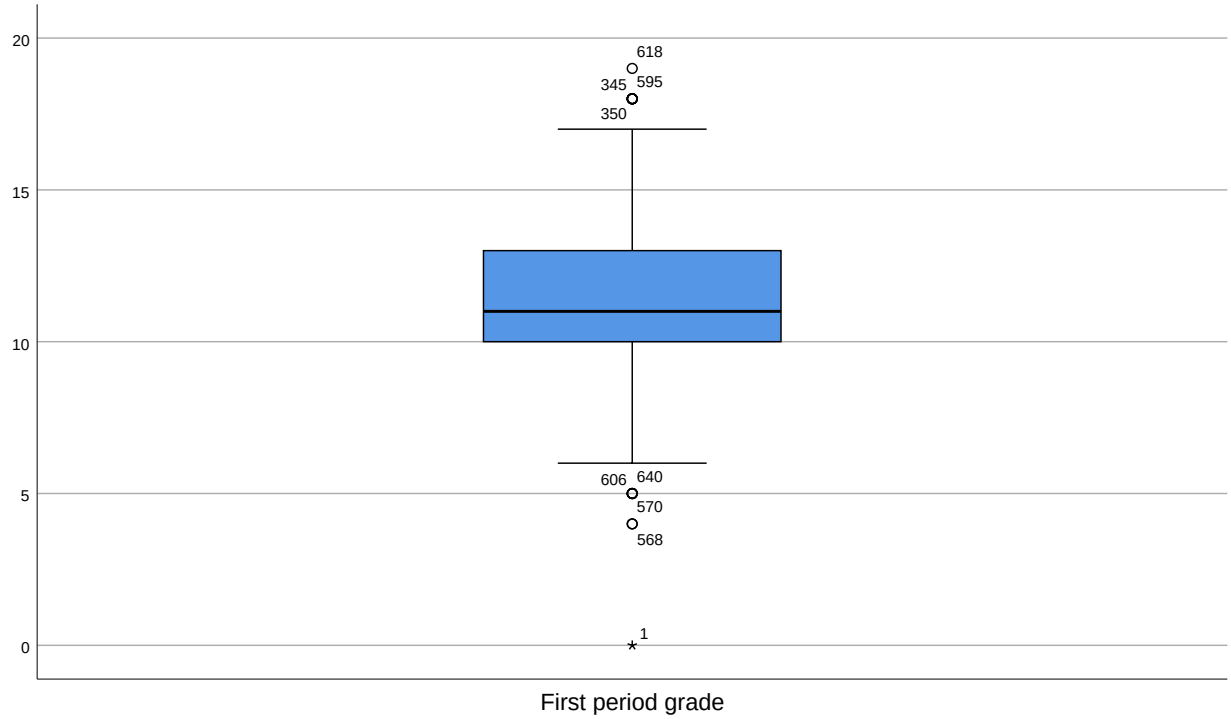
Descriptives

		Statistic	Std. Error
	Range	3	
	Interquartile Range	1	
	Skewness	1.248	.096
	Kurtosis	1.109	.192

First period grade

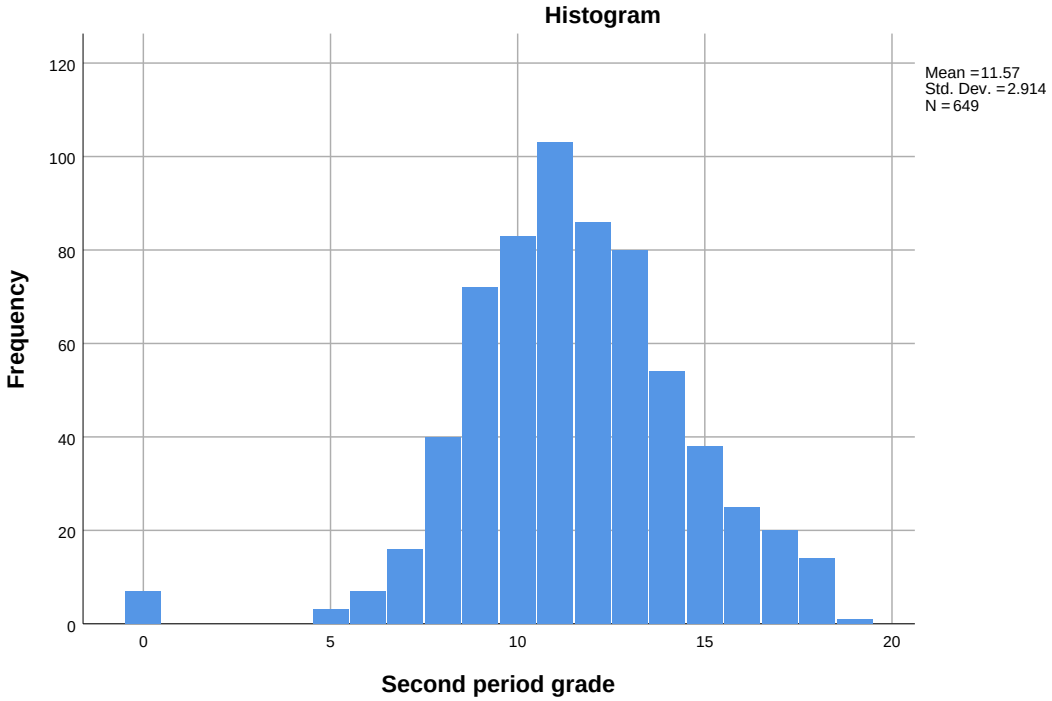


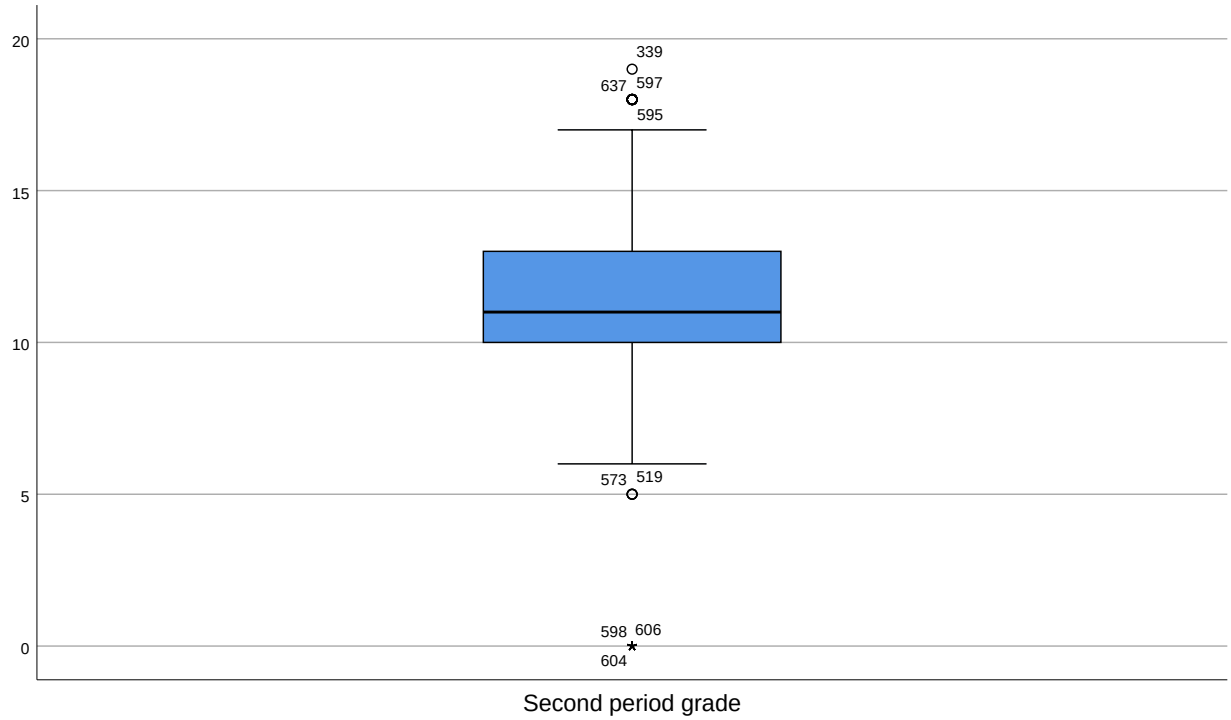
Predictor descriptive statistics
Variables used in collinearity check



Second period grade

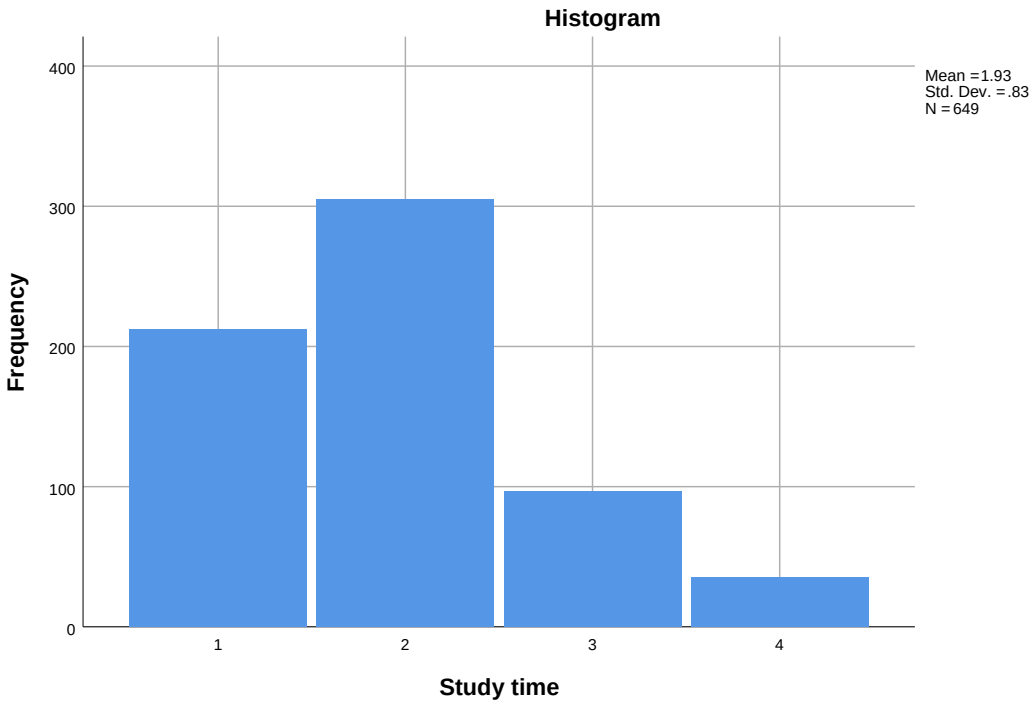
Predictor descriptive statistics
Variables used in collinearity check



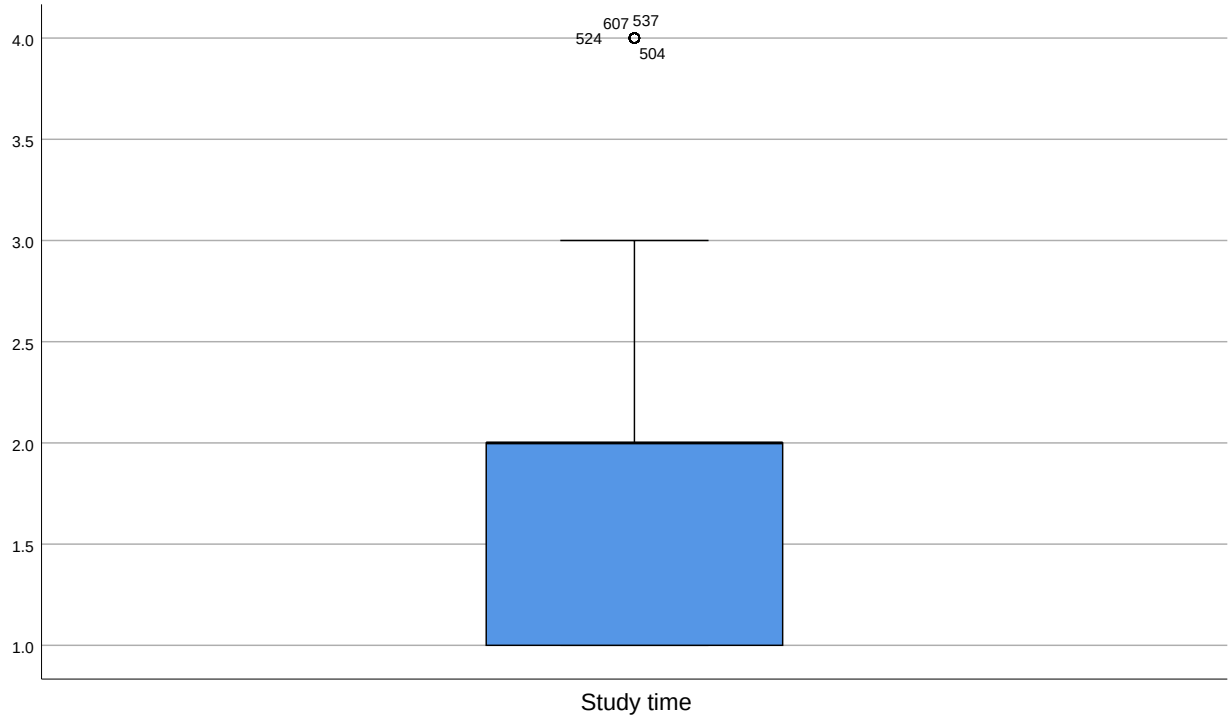


Predictor descriptive statistics
Variables used in collinearity check

Study time

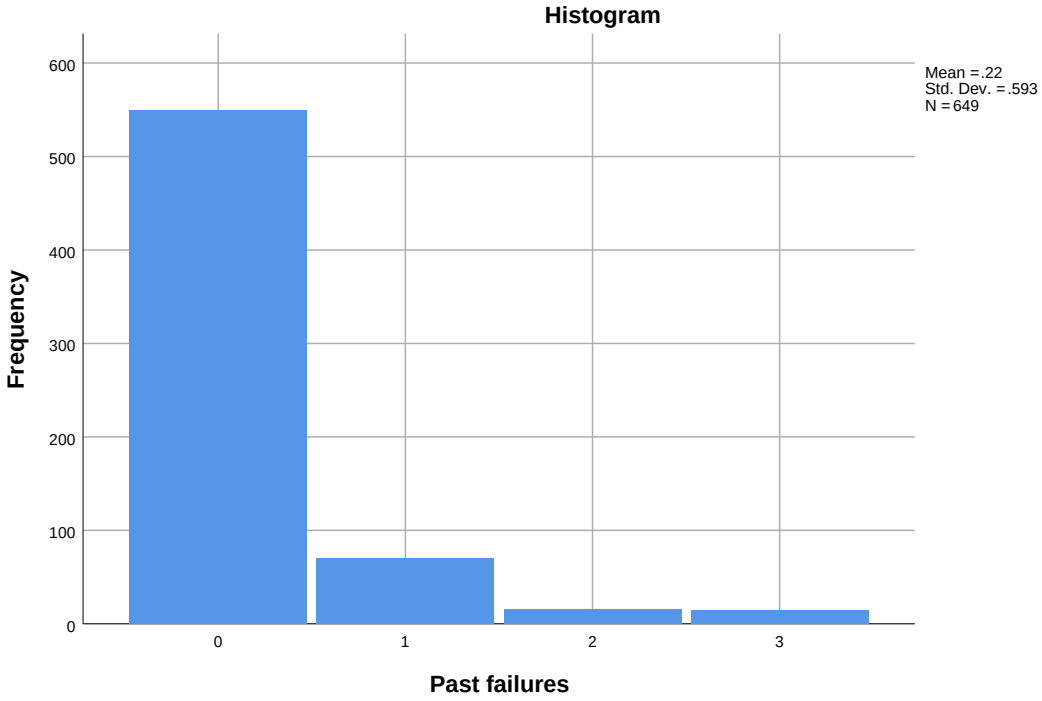


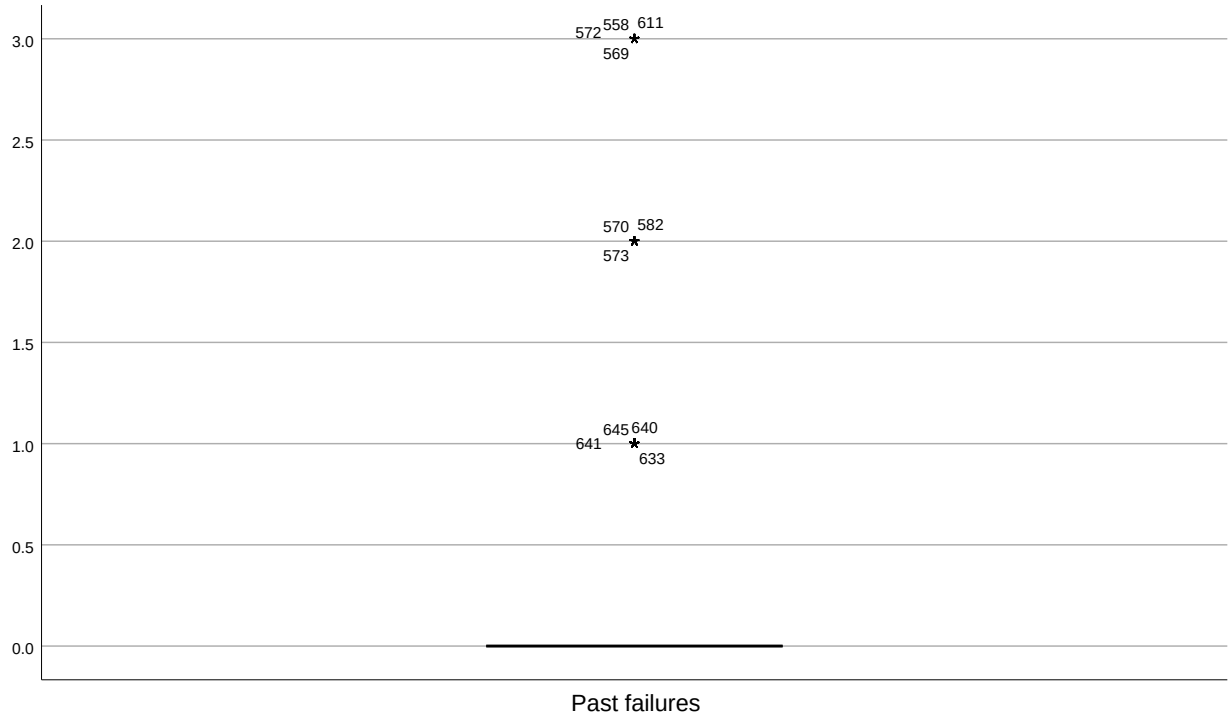
Predictor descriptive statistics
Variables used in collinearity check



Past failures

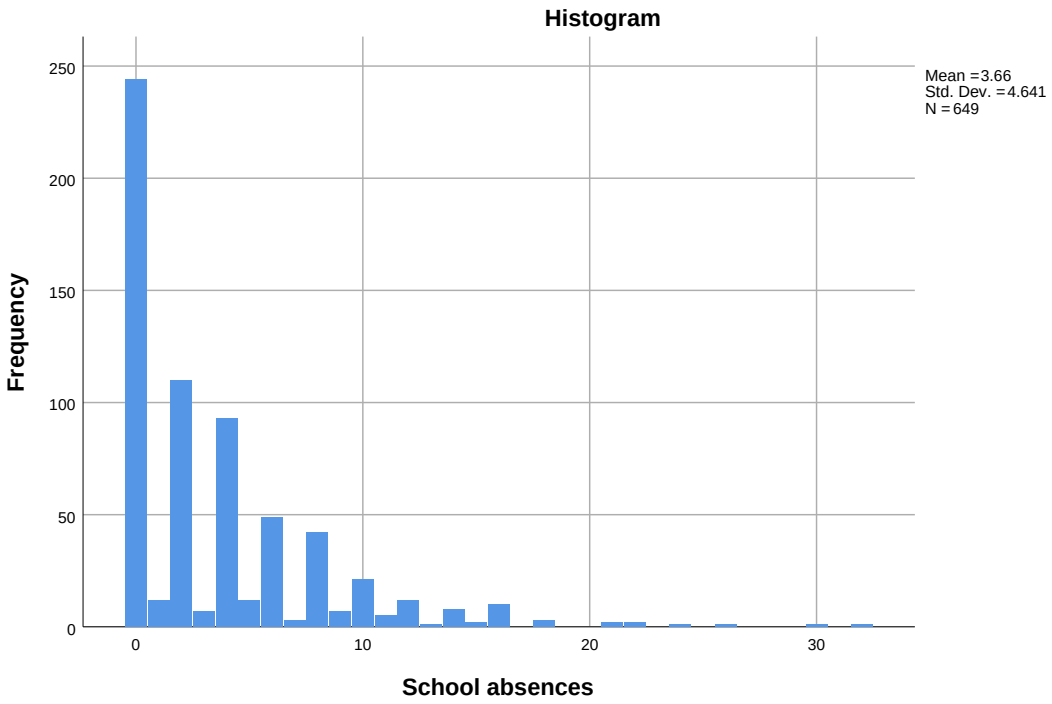
Predictor descriptive statistics
Variables used in collinearity check



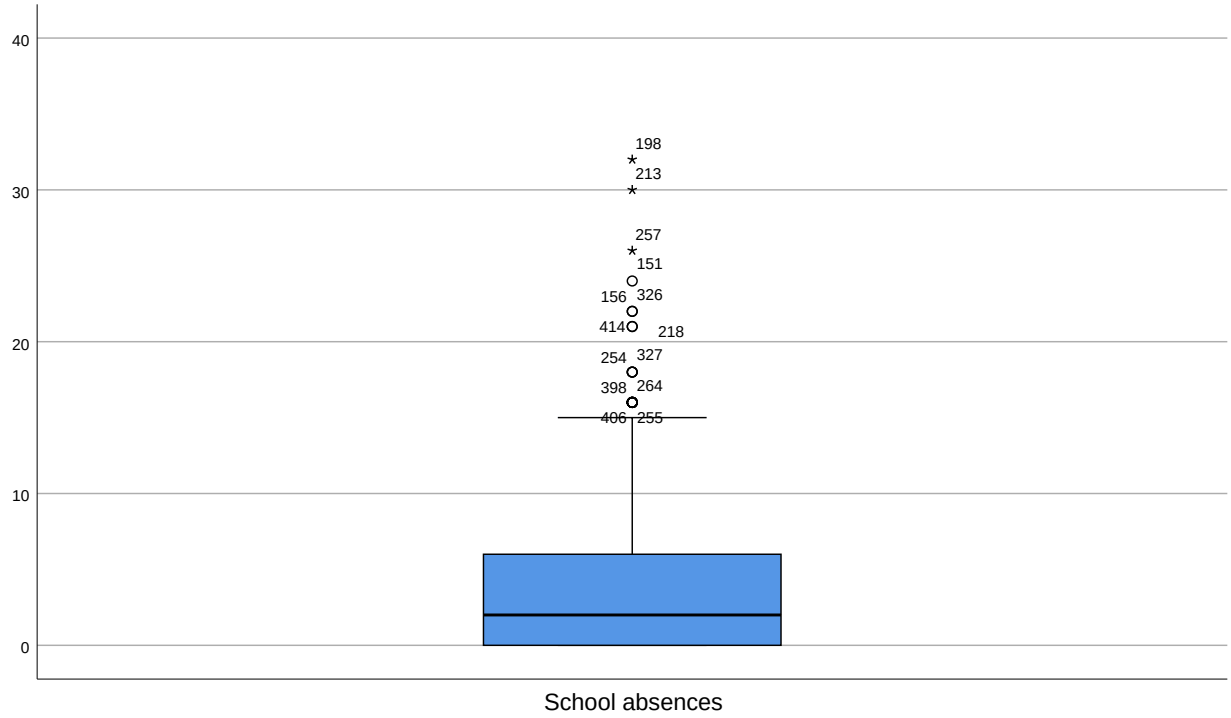


Predictor descriptive statistics
Variables used in collinearity check

School absences

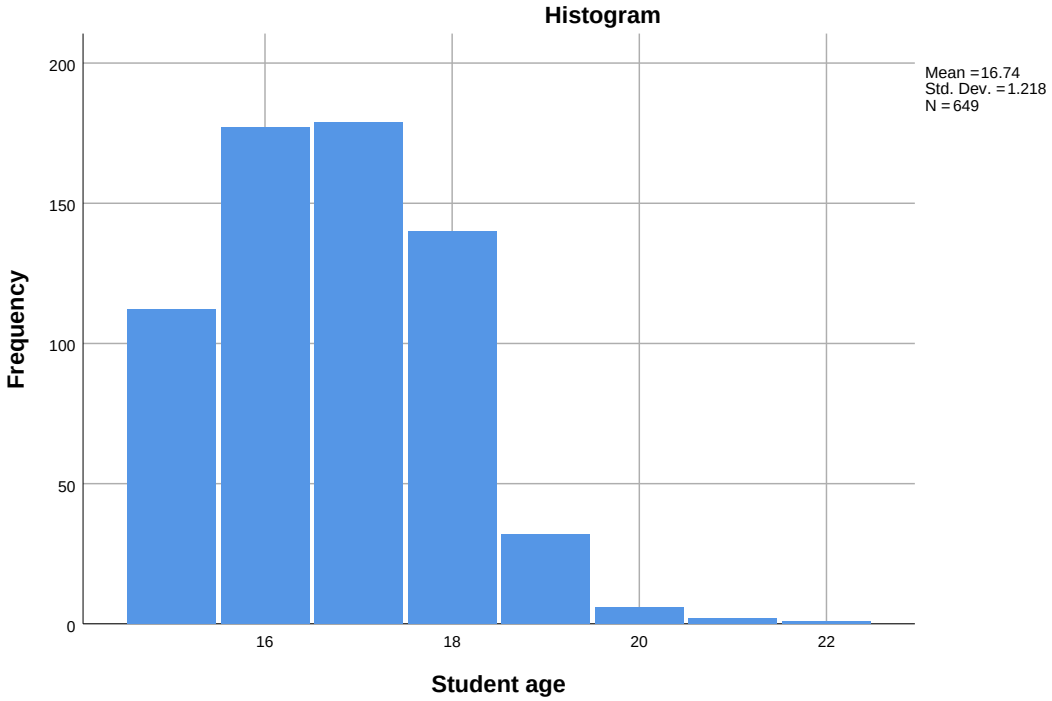


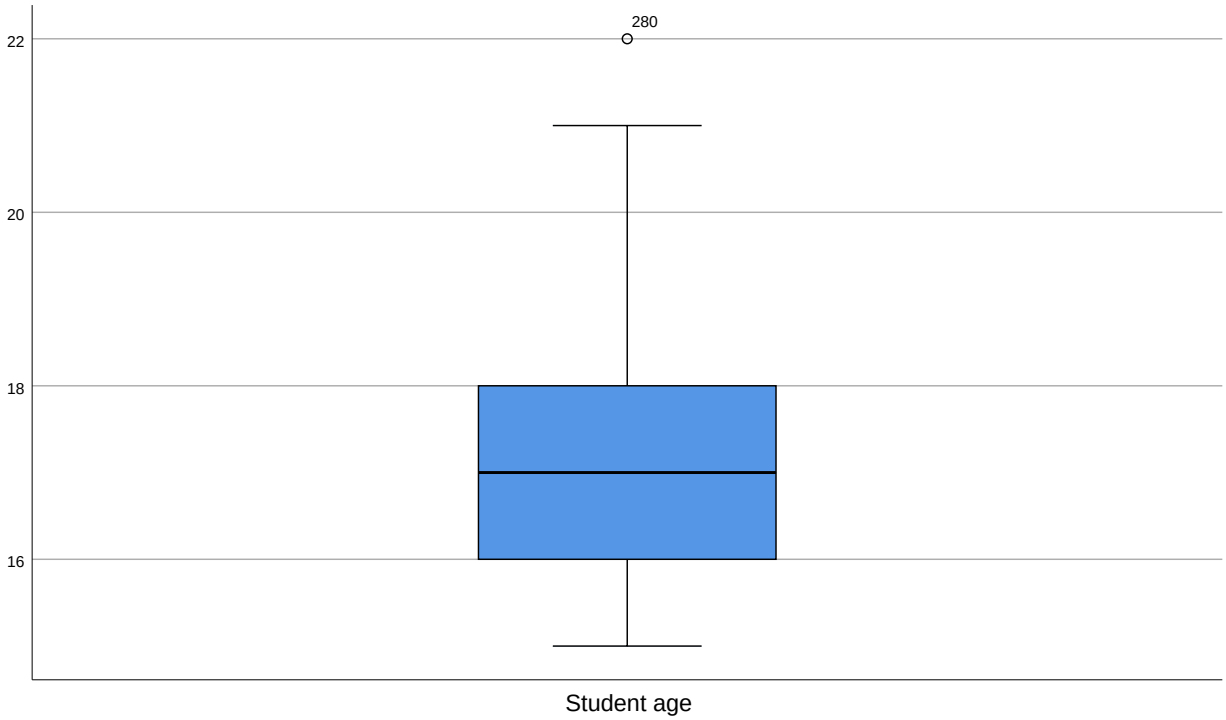
Predictor descriptive statistics
Variables used in collinearity check



Student age

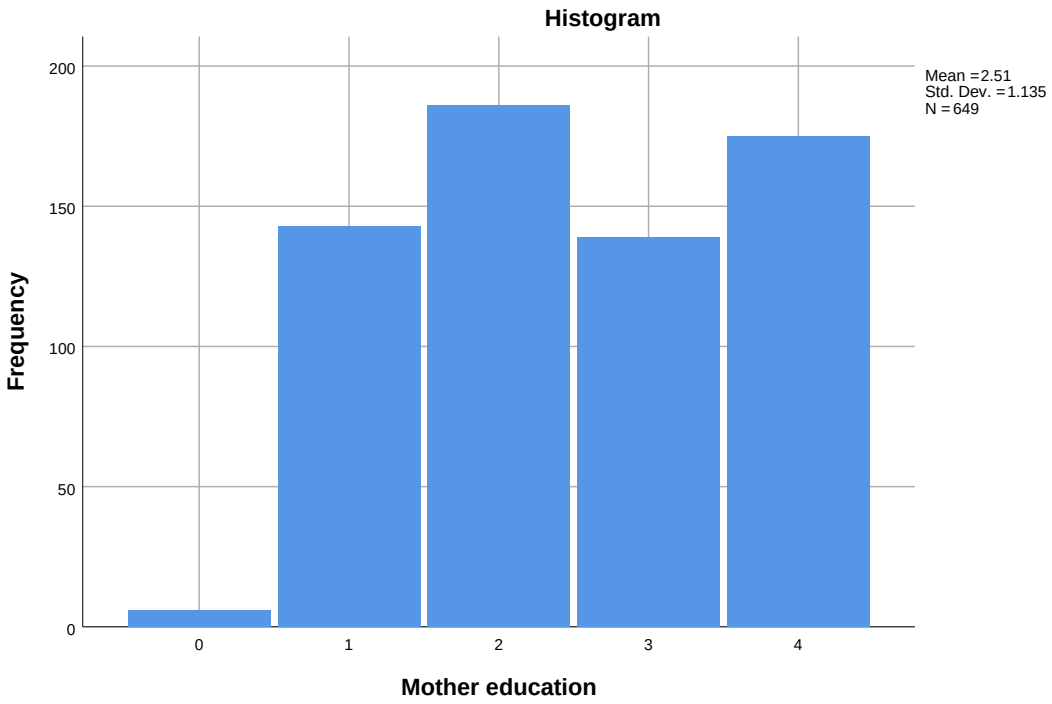
Predictor descriptive statistics
Variables used in collinearity check



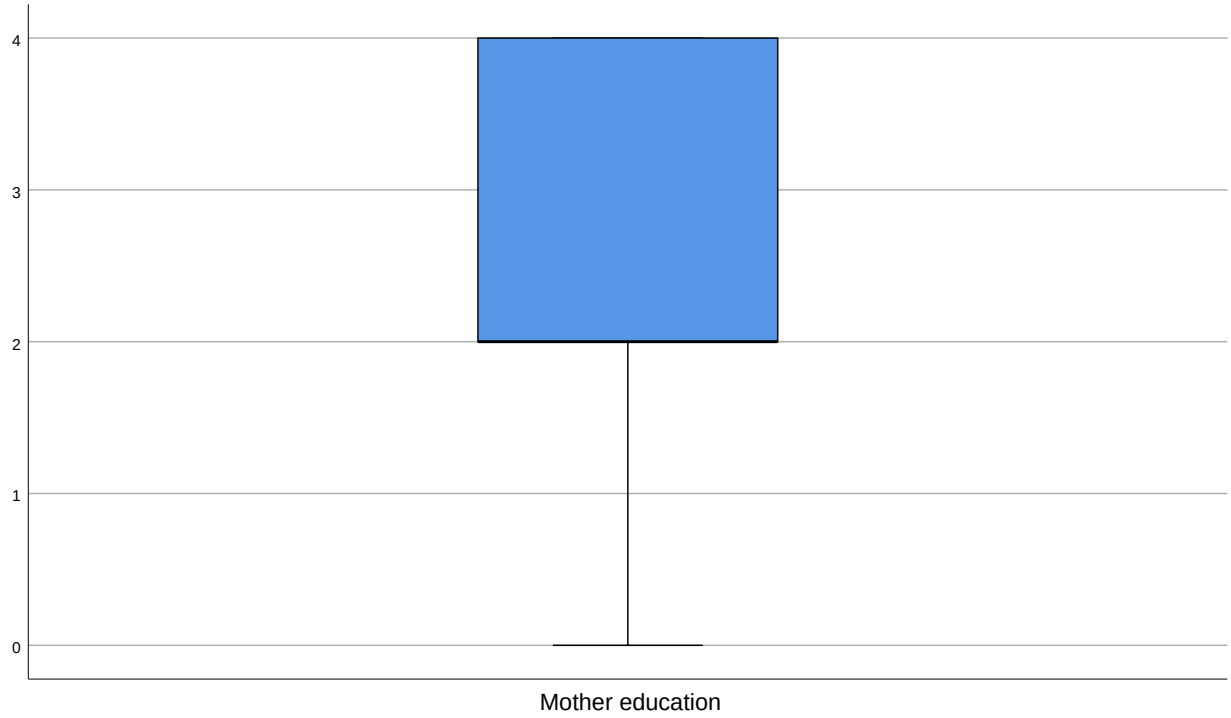


Predictor descriptive statistics
Variables used in collinearity check

Mother education

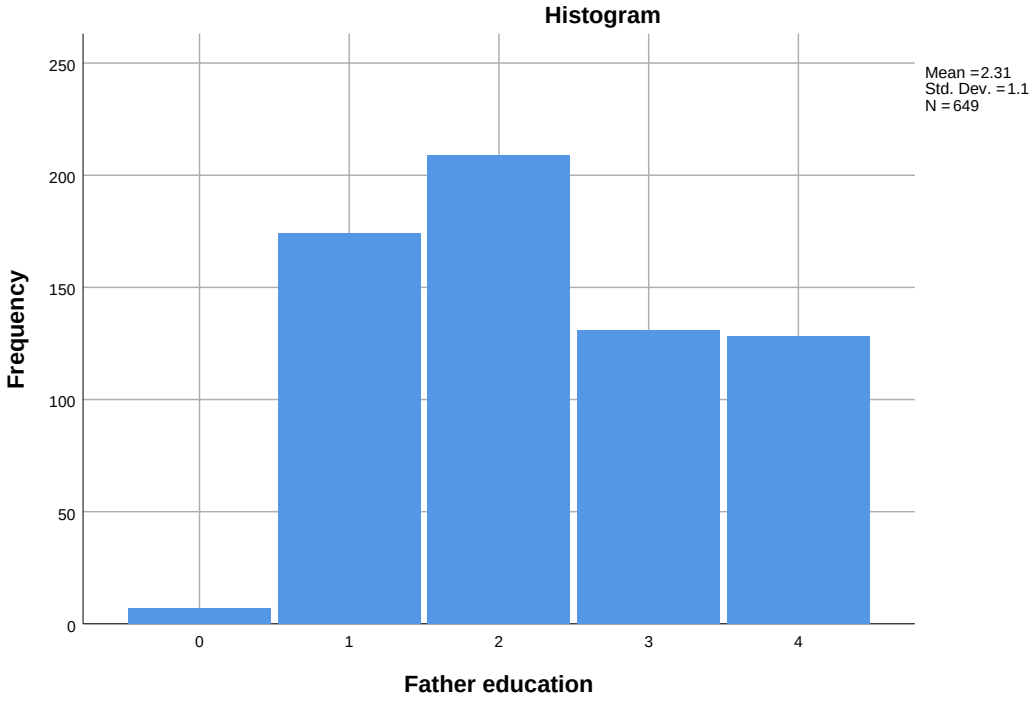


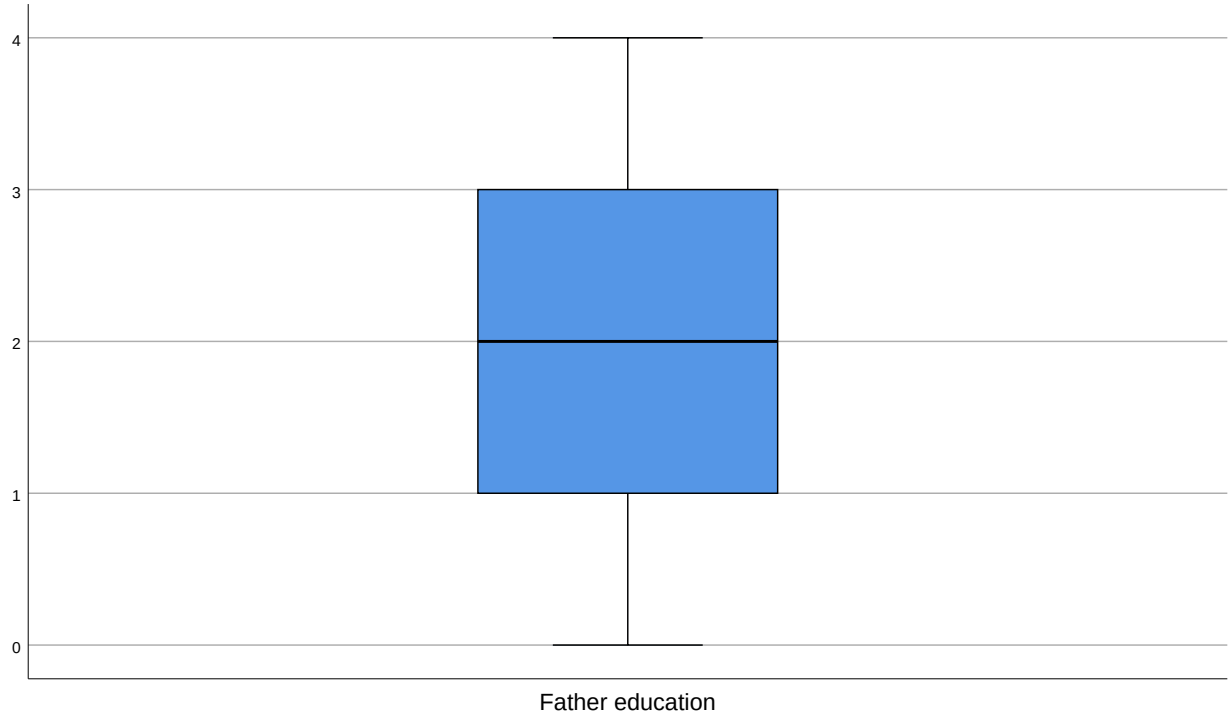
Predictor descriptive statistics
Variables used in collinearity check



Father education

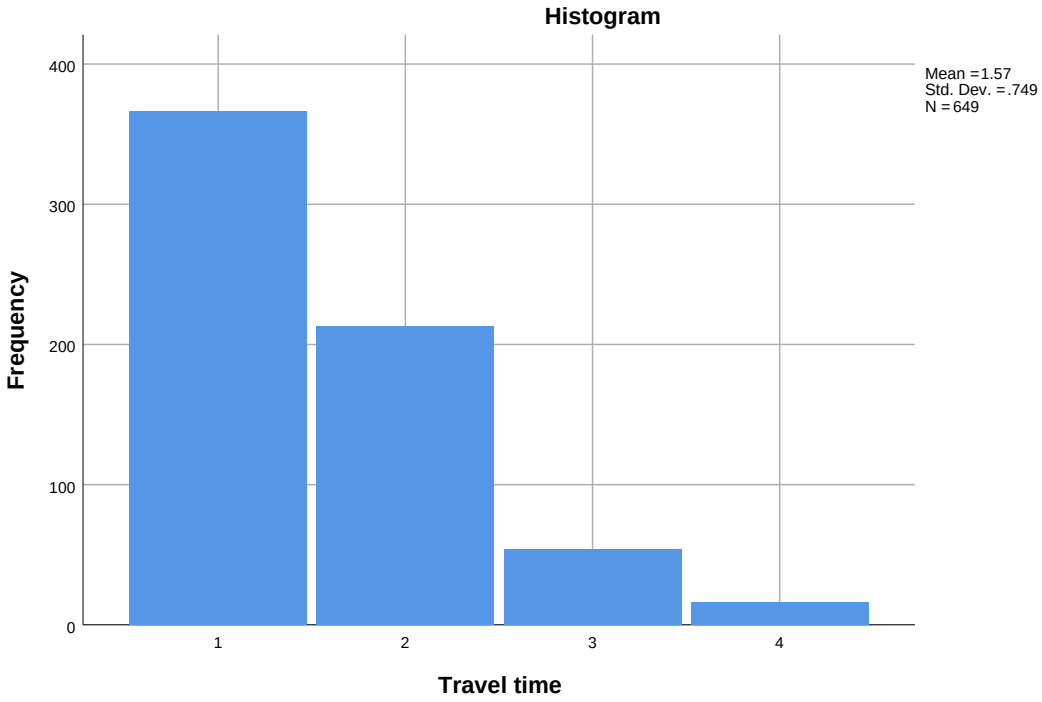
Predictor descriptive statistics
Variables used in collinearity check





Predictor descriptive statistics
Variables used in collinearity check

Travel time



Predictor descriptive statistics
Variables used in collinearity check