

**Host**

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## Log Transformation

Log Transformation  
Import data

Before log transformation

Before log transformation  
Original variable shape

## Explore

[LogTransformationData] D:\DATA ANALYSIS\B Normality and Assumption Tests\Log Transformation\SPSS\_Output\sav\Log-Transformation-data.sav

### Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
G3	649	100.0%	0	0.0%	649	100.0%
G2	649	100.0%	0	0.0%	649	100.0%
G1	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%

### Descriptives

		Statistic	Std. Error	
G3	Mean	11.91	.127	
	95% Confidence Interval for Mean	Lower Bound	11.66	
		Upper Bound	12.16	
	5% Trimmed Mean	12.06		
	Median	12.00		
	Variance	10.437		
	Std. Deviation	3.231		
	Minimum	0		
	Maximum	19		
	Range	19		
	Interquartile Range	4		
	Skewness	-.913	.096	
	Kurtosis	2.712	.192	
G2	Mean	11.57	.114	
	95% Confidence Interval for Mean	Lower Bound	11.35	
		Upper Bound	11.79	
	5% Trimmed Mean	11.60		
	Median	11.00		

Before log transformation  
Original variable shape

### Descriptives

		Statistic	Std. Error
	Variance	8.489	
	Std. Deviation	2.914	
	Minimum	0	
	Maximum	19	
	Range	19	
	Interquartile Range	3	
	Skewness	-.360	.096
	Kurtosis	1.662	.192
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
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	

Before log transformation  
Original variable shape

### Descriptives

		Statistic	Std. Error	
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	

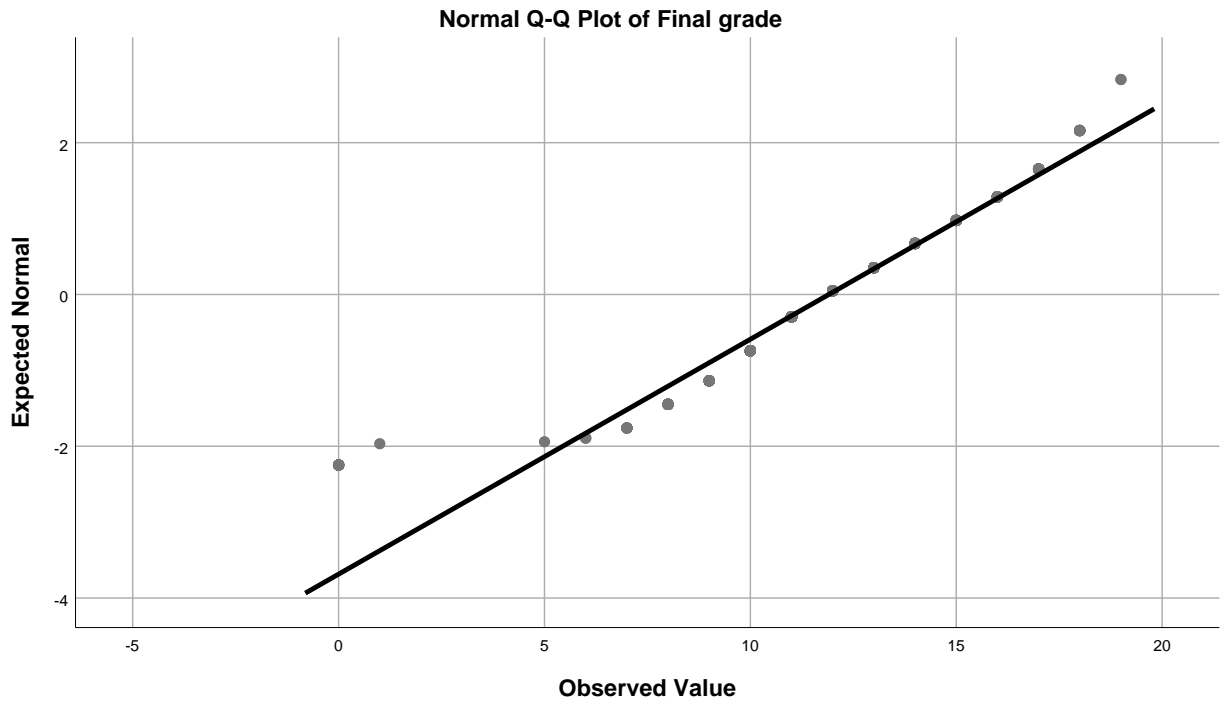
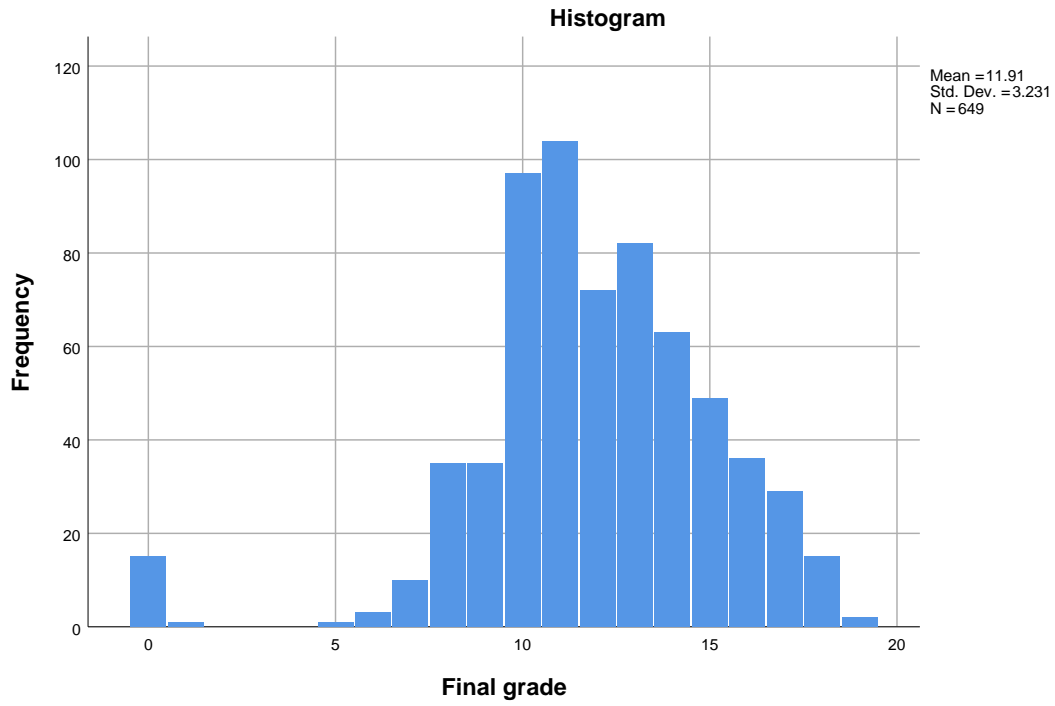
### Tests of Normality

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
G3	.124	649	.000	.926	649	.000
G2	.088	649	.000	.962	649	.000
G1	.086	649	.000	.986	649	.000
absences	.215	649	.000	.772	649	.000
age	.175	649	.000	.916	649	.000

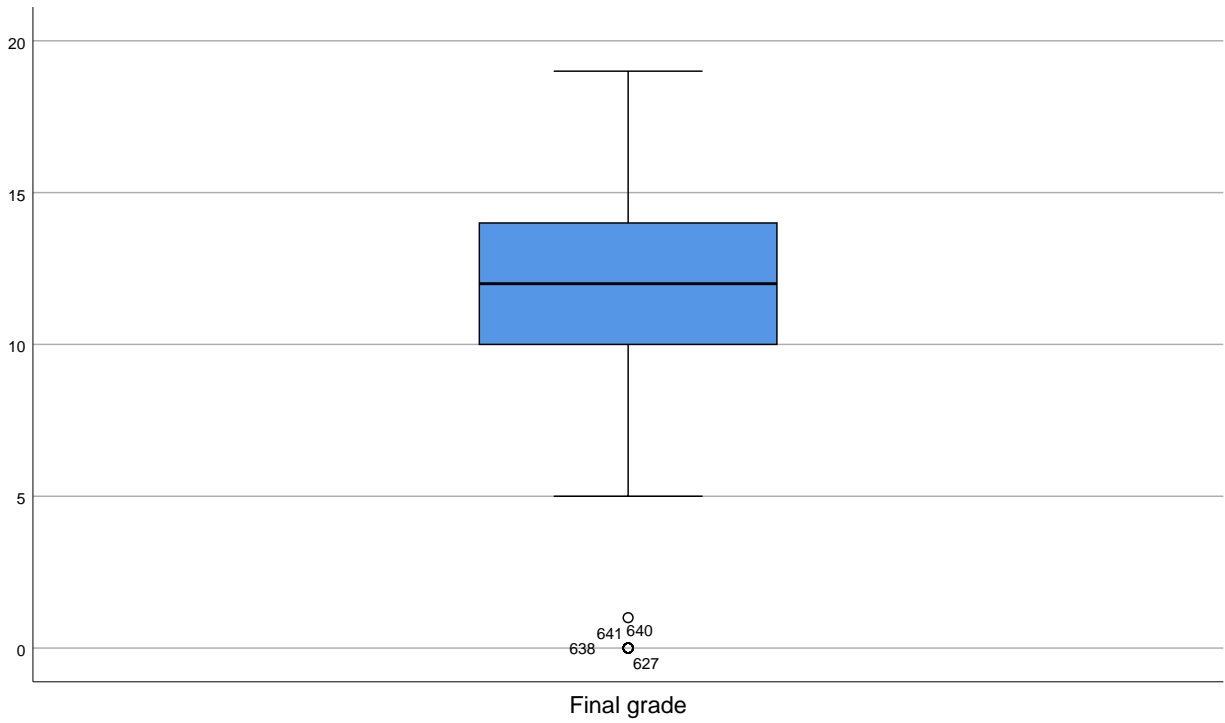
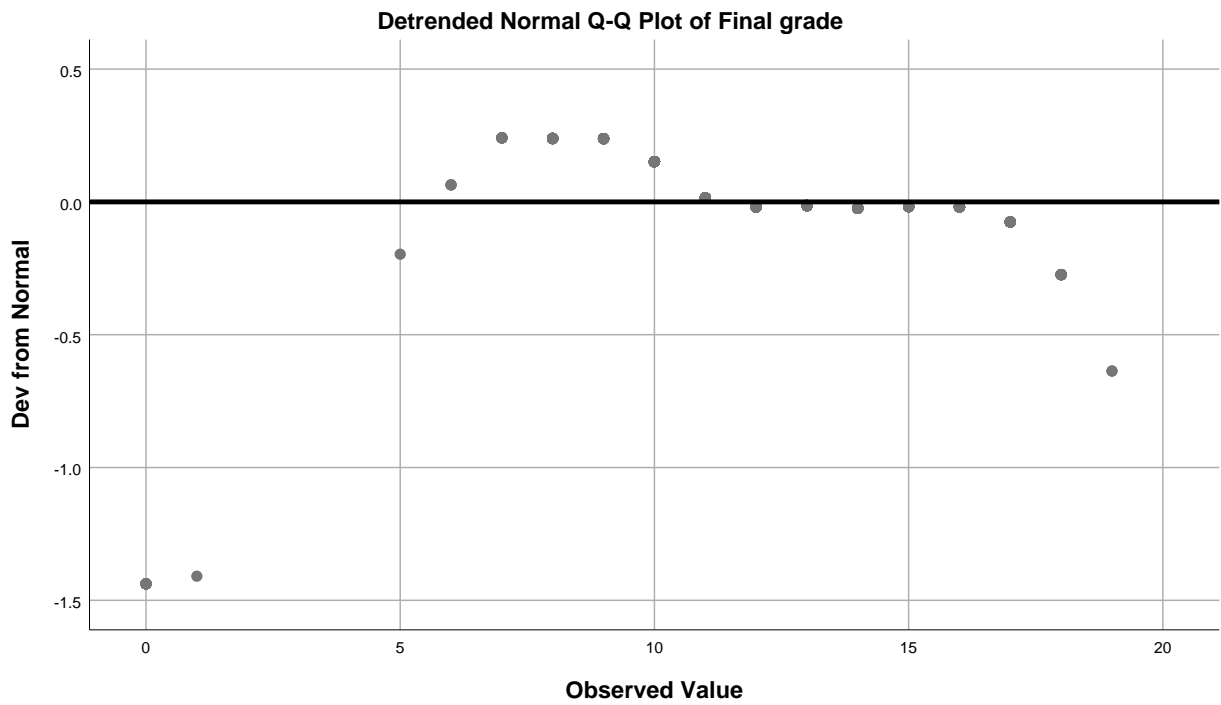
a. Lilliefors Significance Correction

## Final grade

Before log transformation  
Original variable shape

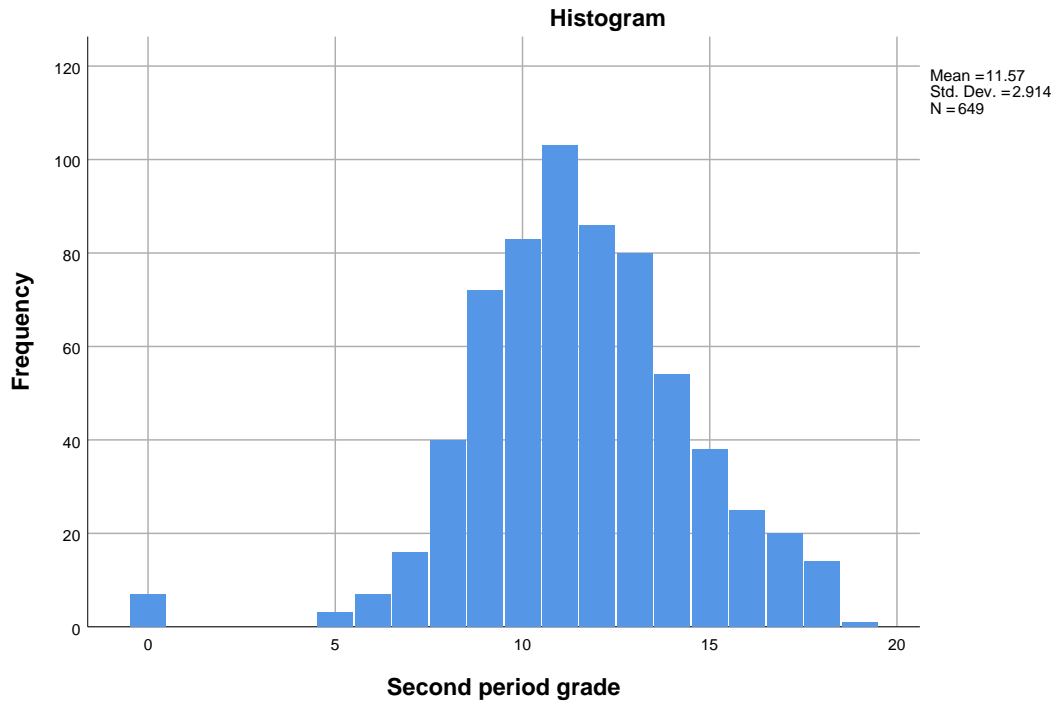


Before log transformation  
Original variable shape

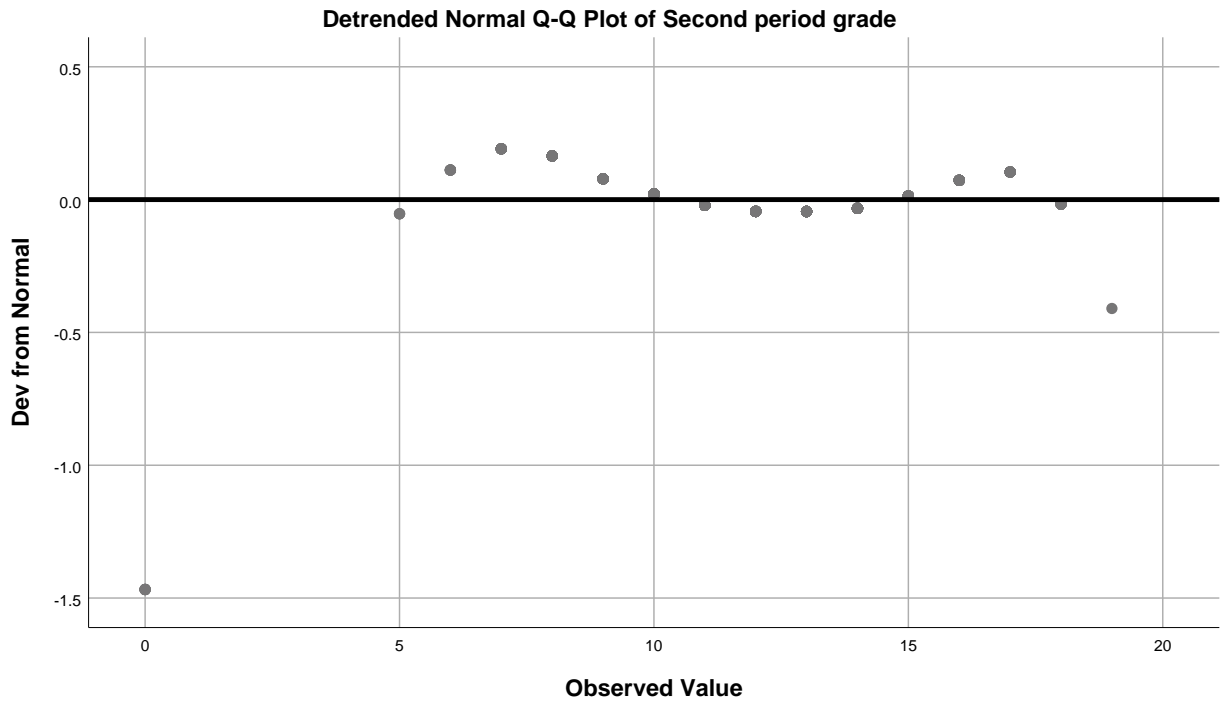
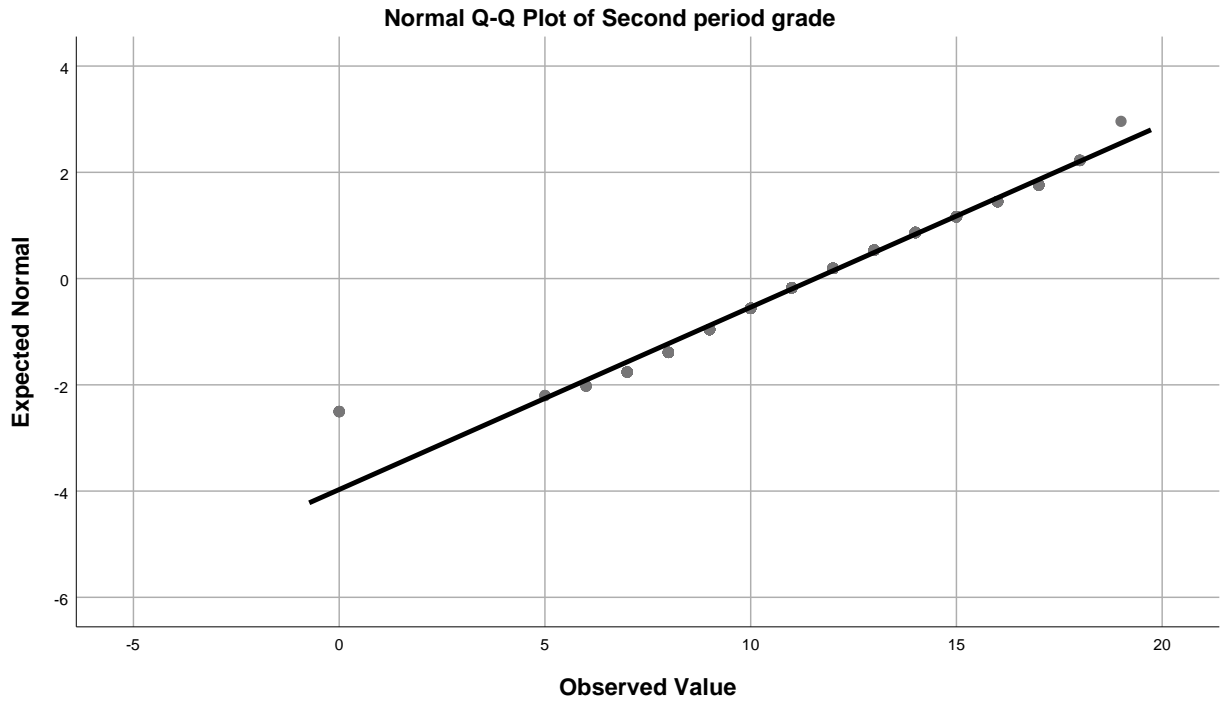


Before log transformation  
Original variable shape

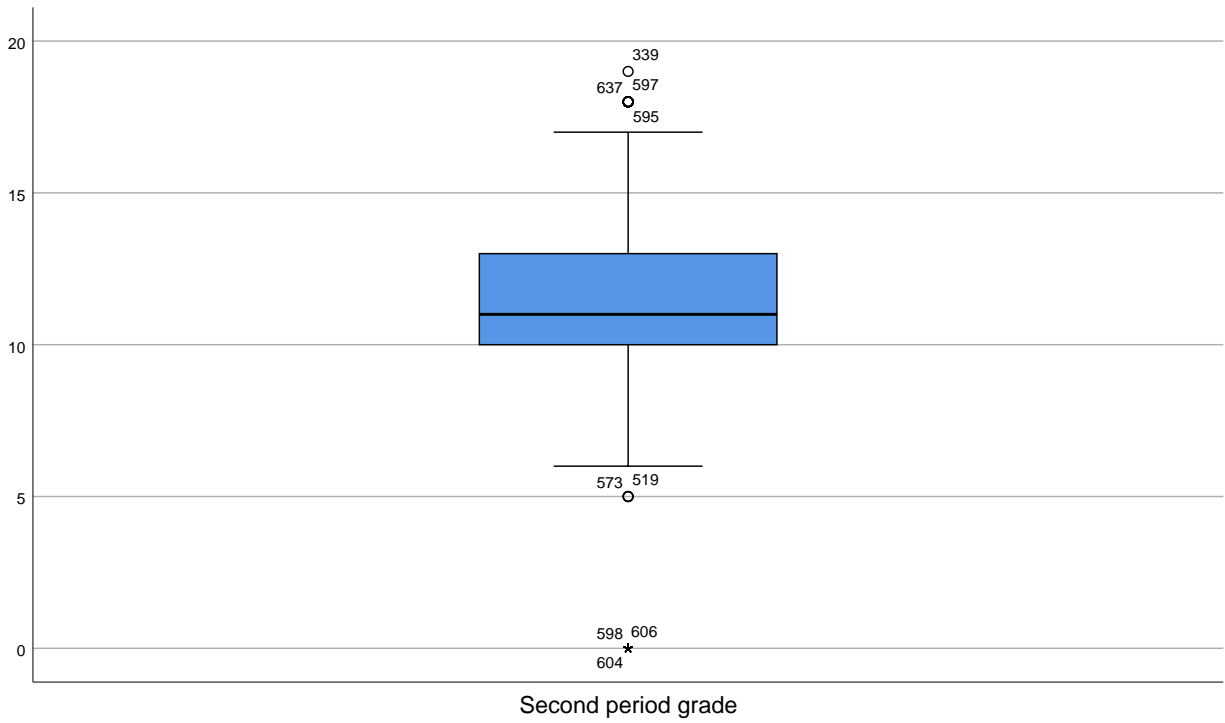
## Second period grade



Before log transformation  
Original variable shape

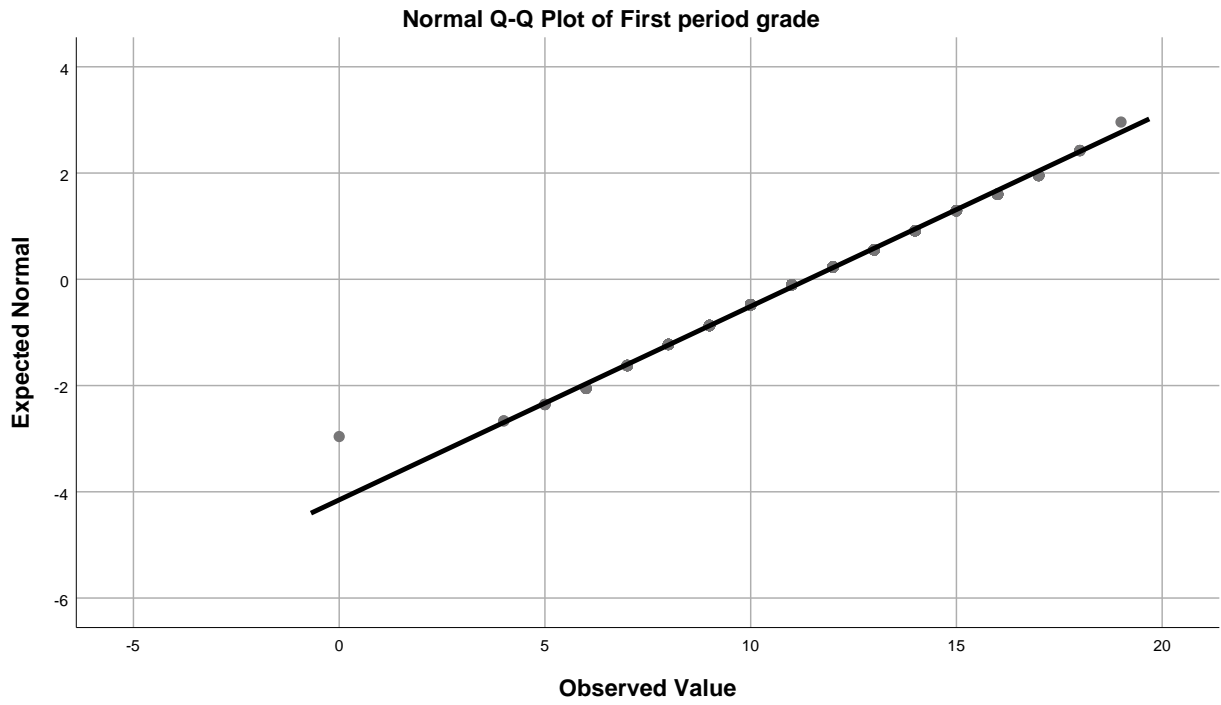
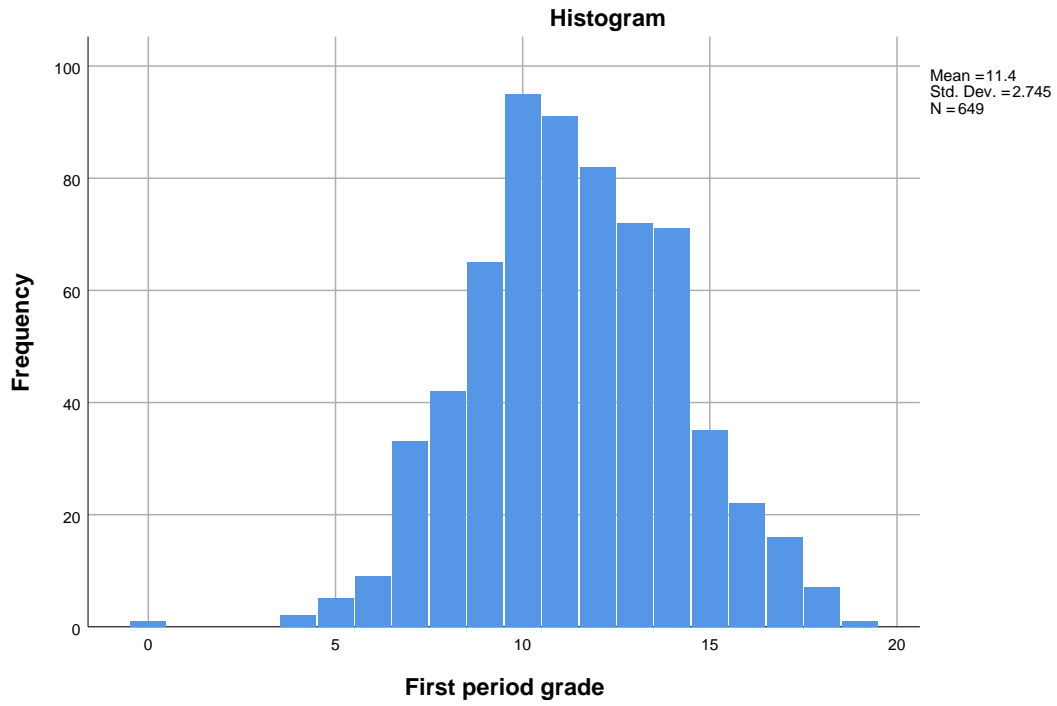


Before log transformation  
Original variable shape

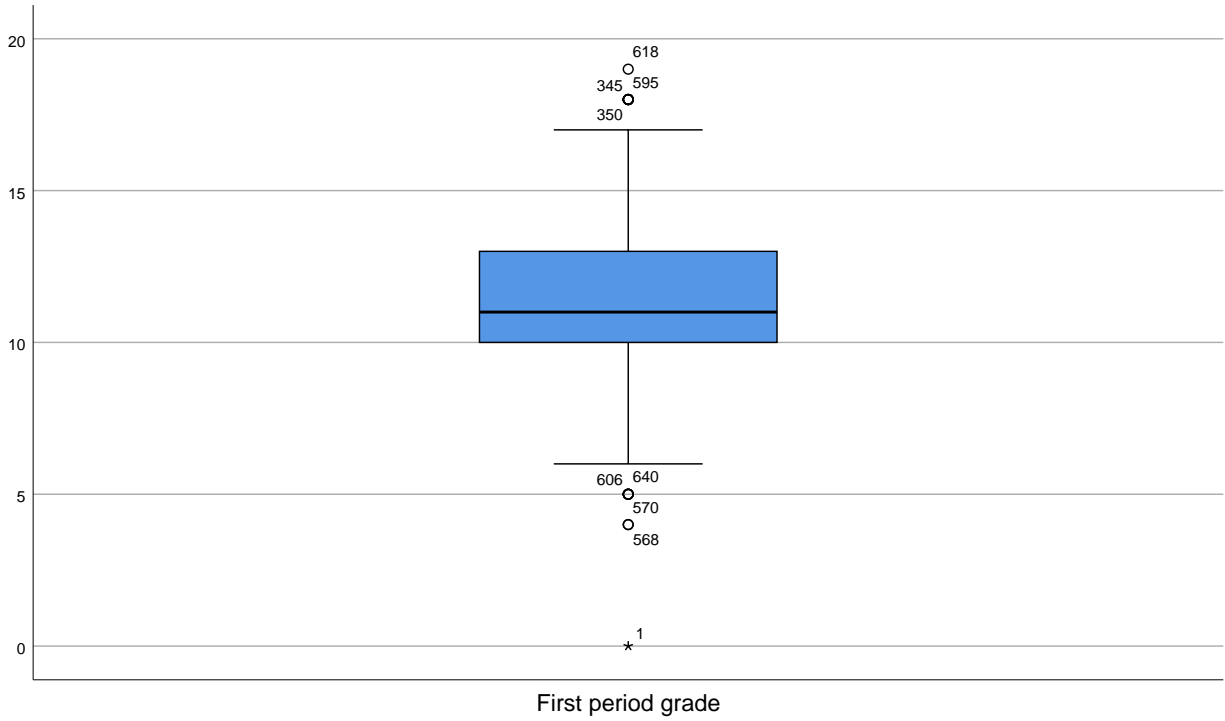
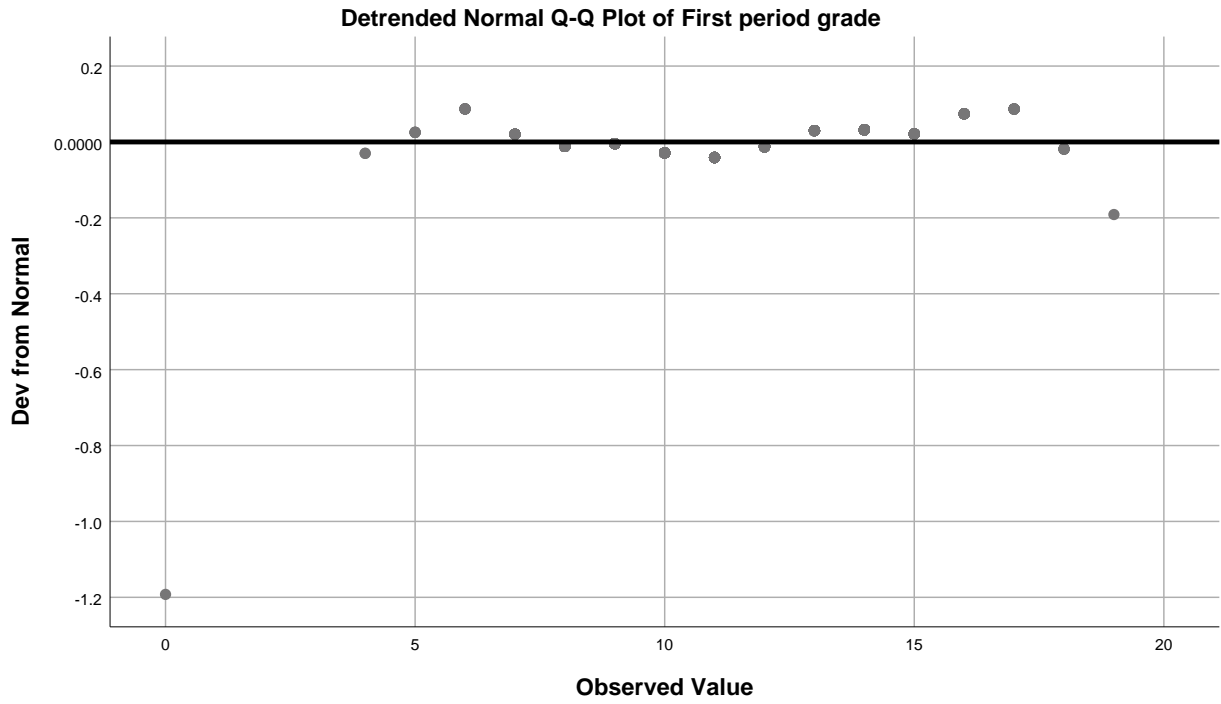


**First period grade**

Before log transformation  
Original variable shape

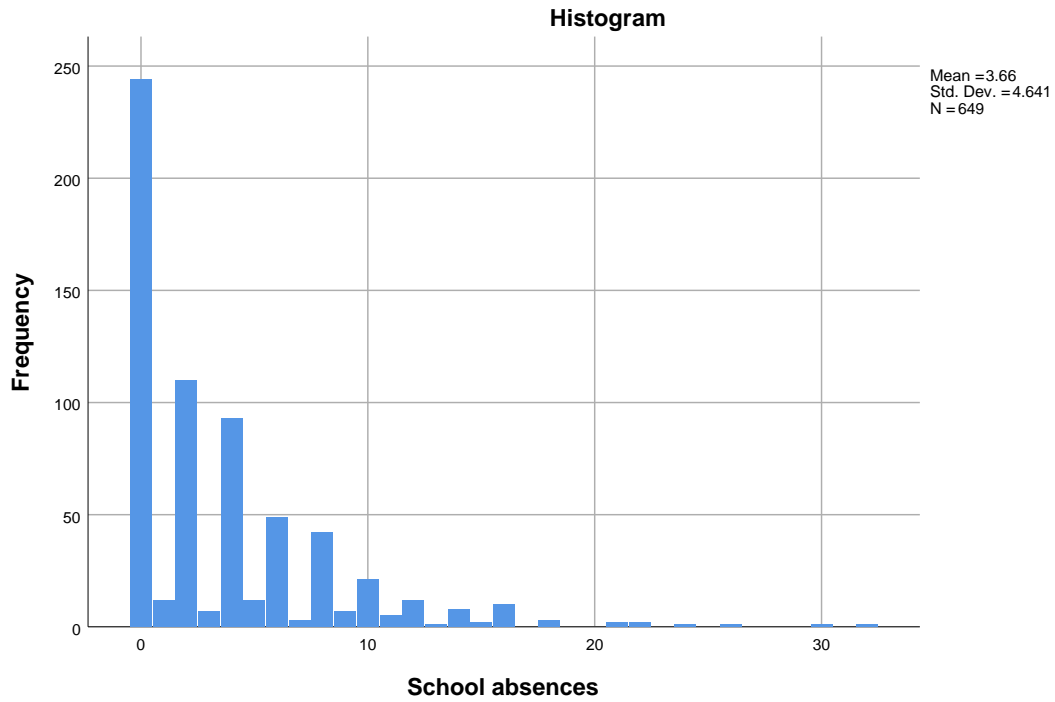


Before log transformation  
Original variable shape

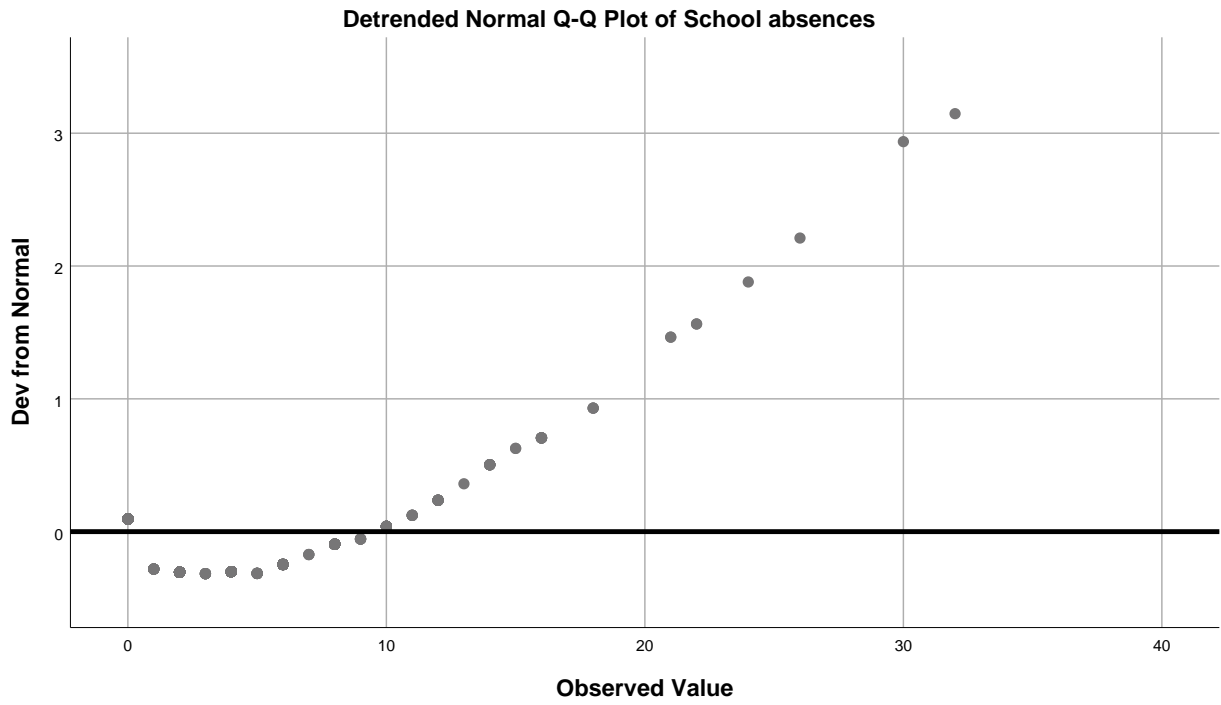
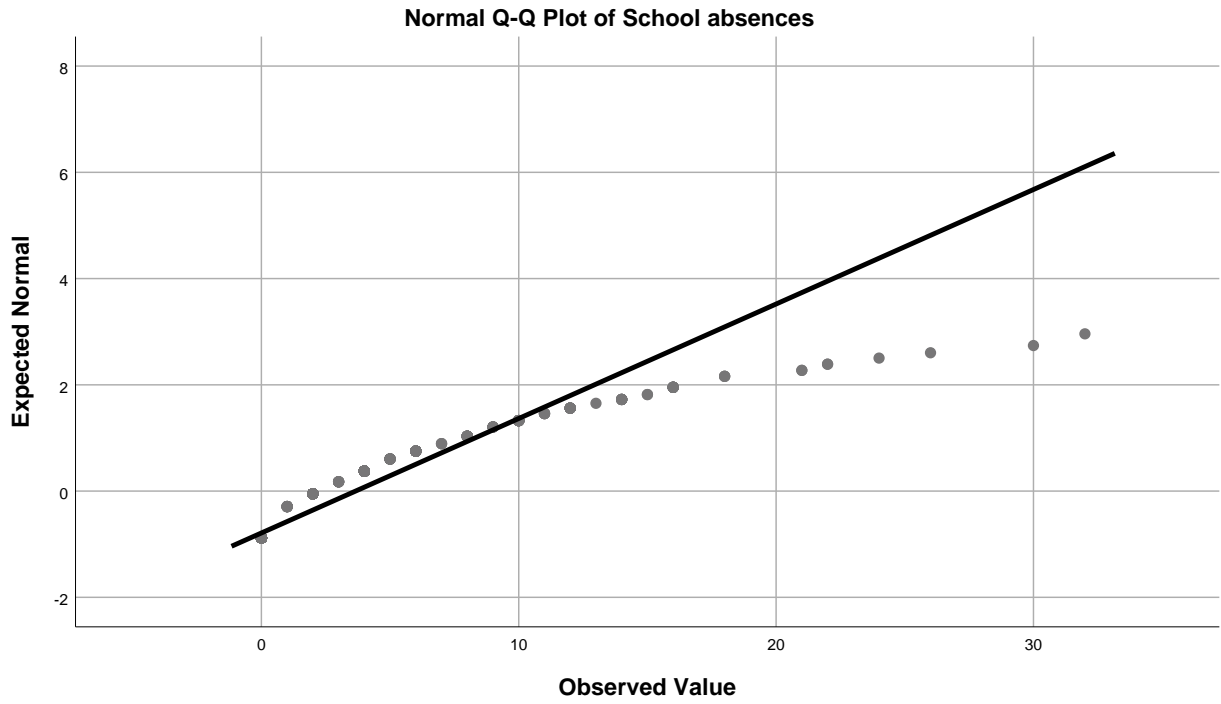


Before log transformation  
Original variable shape

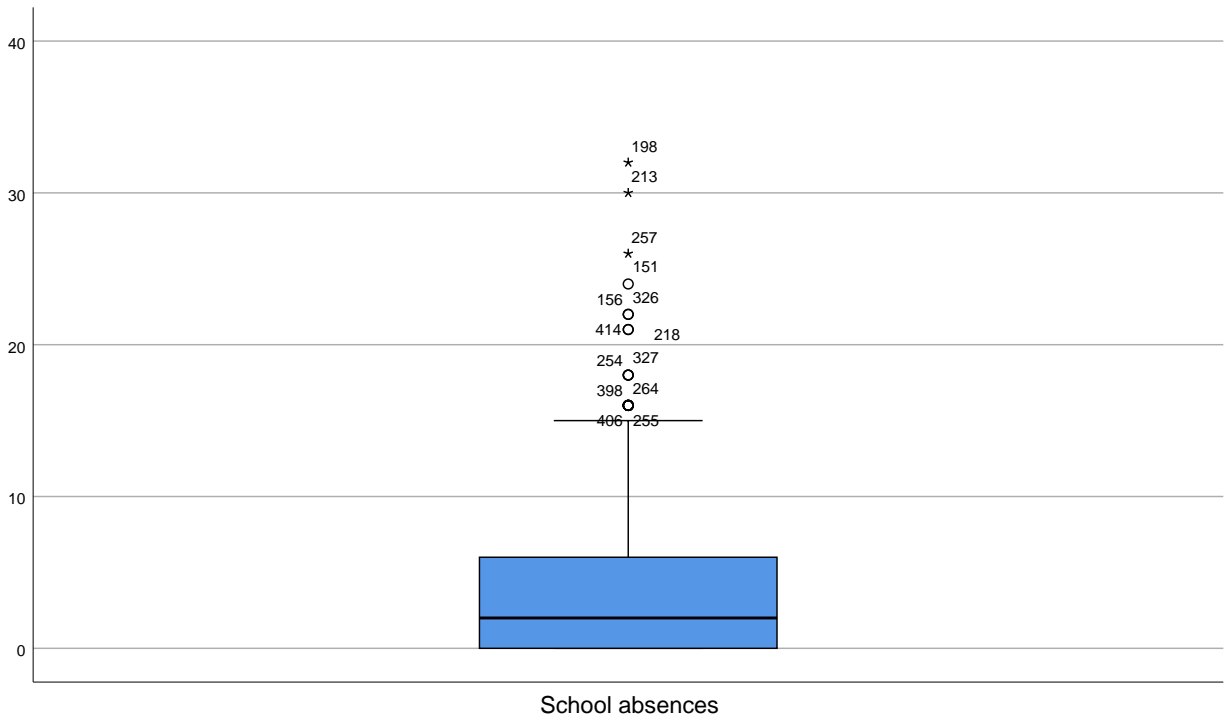
## School absences



Before log transformation  
Original variable shape

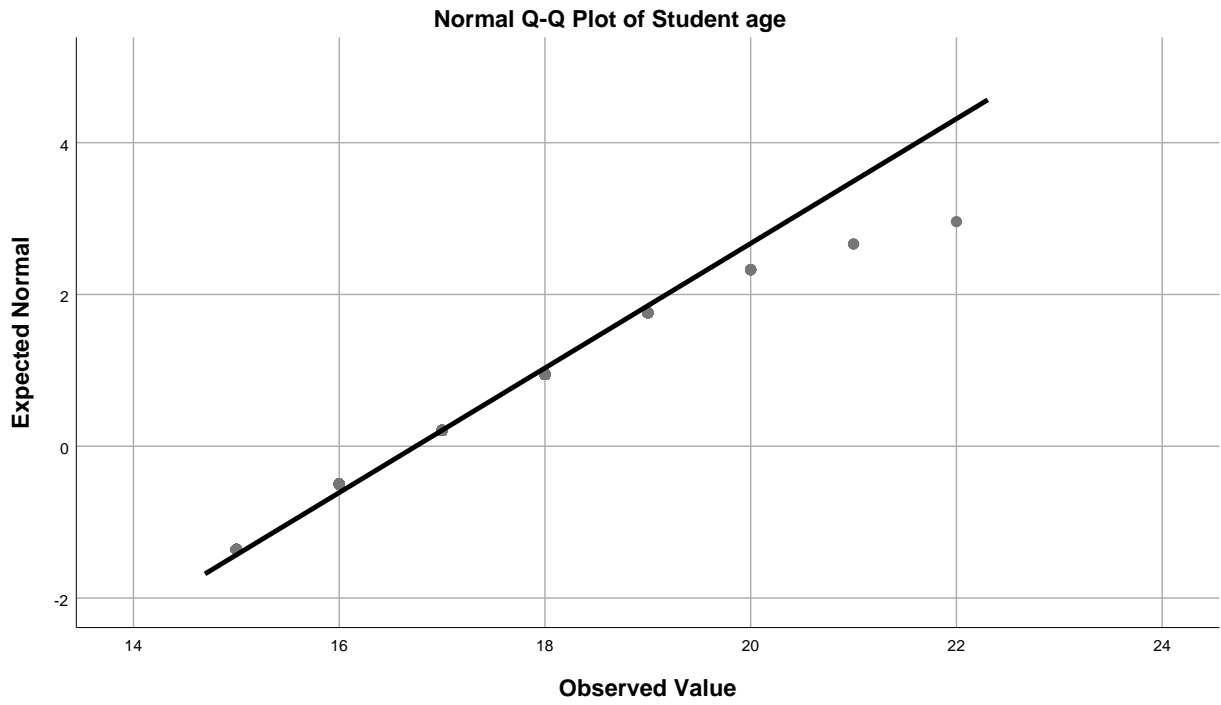
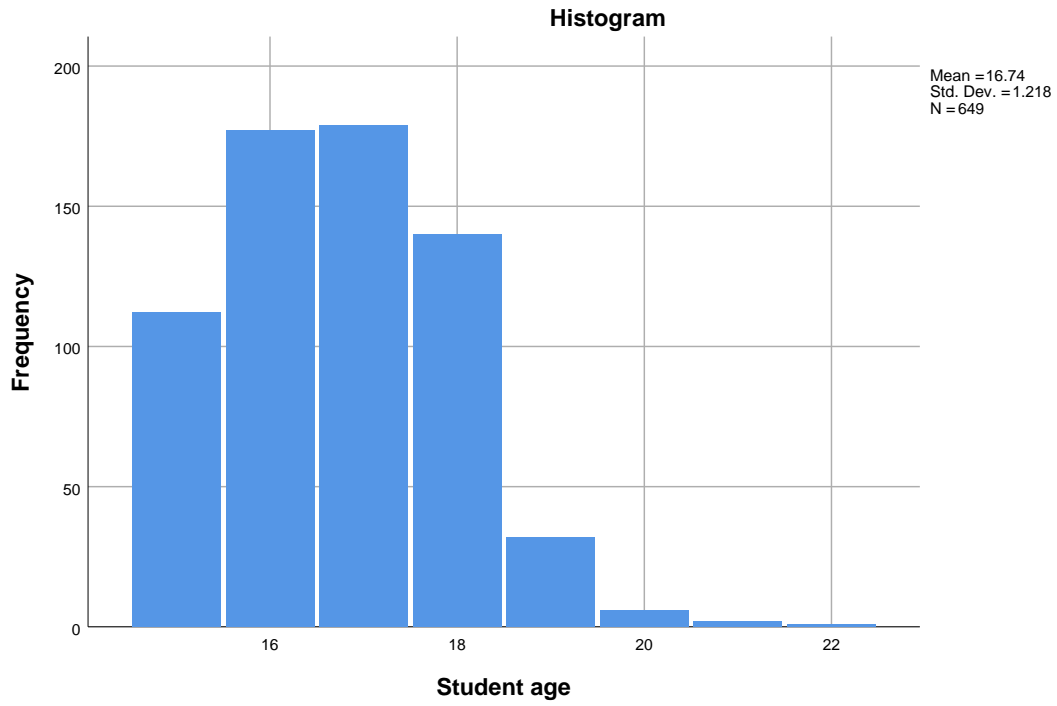


Before log transformation  
Original variable shape

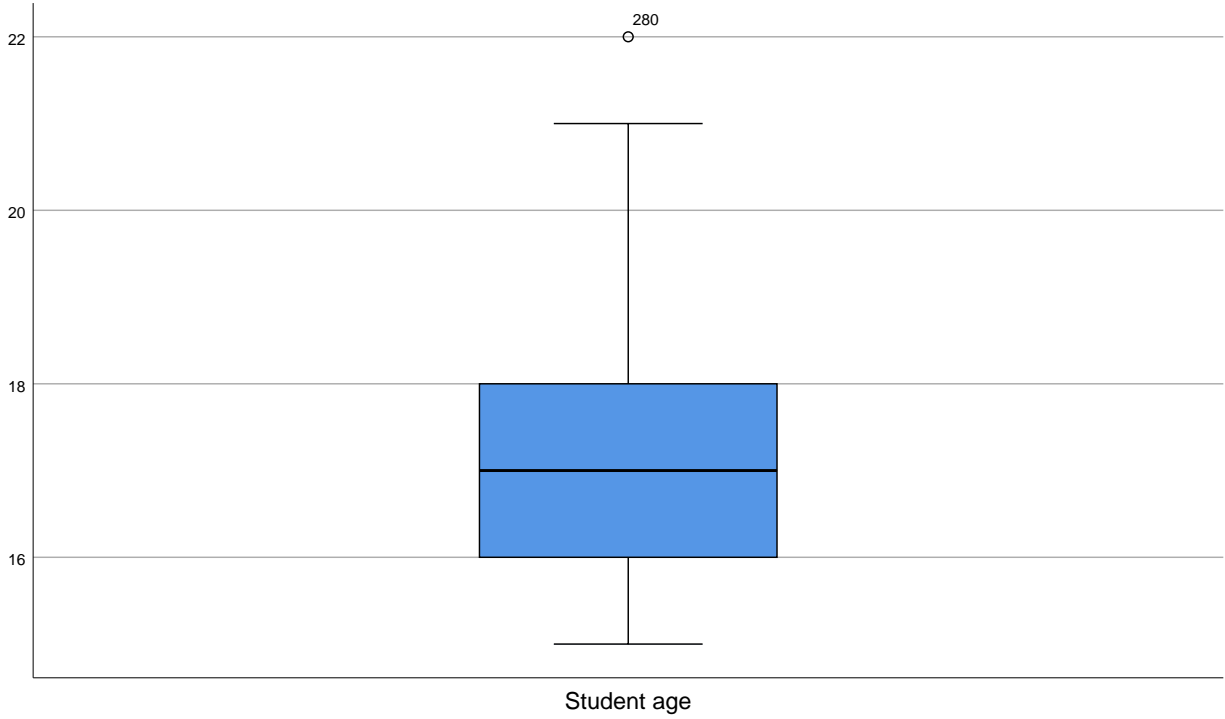
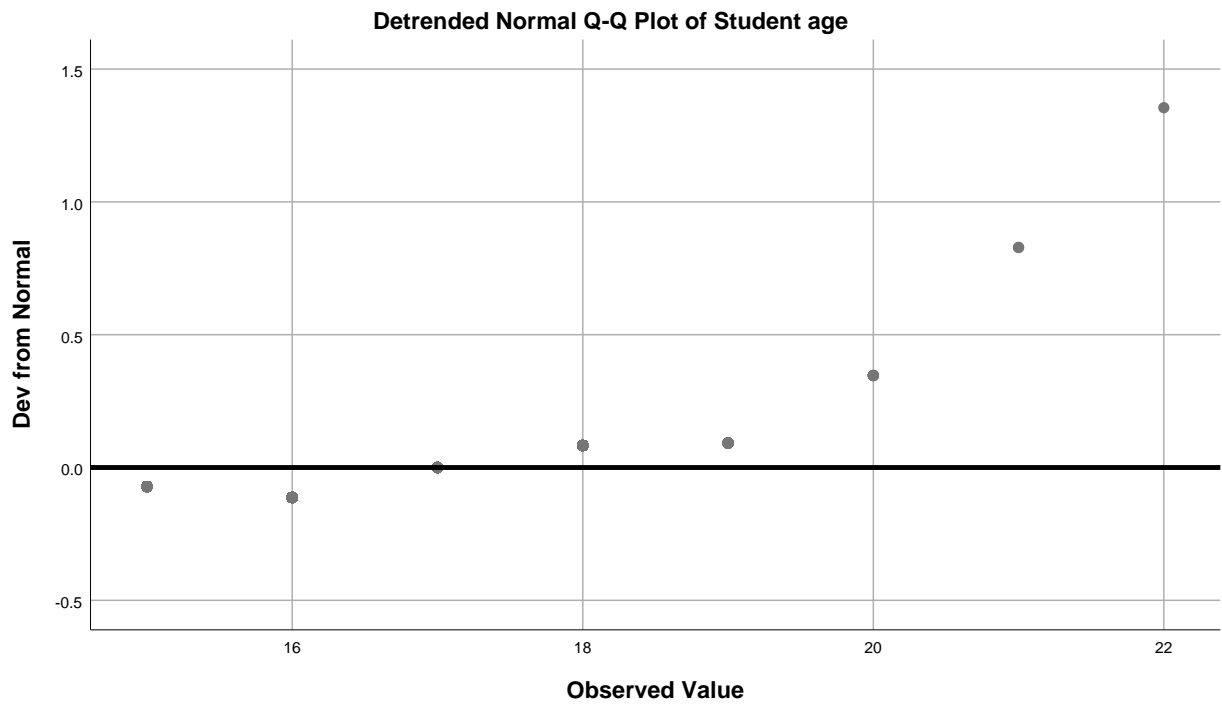


**Student age**

Before log transformation  
Original variable shape



Before log transformation  
Original variable shape



Log transformation shift values

Log transformation shift values  
Values added before natural log

## List

[LogTransformationData] D:\DATA ANALYSIS\B Normality and Assumption Tests\Log Transformation\SPSS\_Output\sav\Log-Transformation-with-log-variables.sav

Log transformation shift values  
Values added before natural log

shift_G3	shift_G2	shift_G1	shift_absences	shift_age
1.00000	1.00000	1.00000	1.00000	.00000

Number of cases read: 1      Number of cases listed: 1

After log transformation

After log transformation  
Transformed variable shape

## Explore

### Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
log_G3	649	100.0%	0	0.0%	649	100.0%
log_G2	649	100.0%	0	0.0%	649	100.0%
log_G1	649	100.0%	0	0.0%	649	100.0%
log_absences	649	100.0%	0	0.0%	649	100.0%
log_age	649	100.0%	0	0.0%	649	100.0%

### Descriptives

		Statistic	Std. Error	
log_G3	Mean	2.4979262	.01730494	
	95% Confidence Interval for Mean	Lower Bound	2.4639457	
		Upper Bound	2.5319067	
	5% Trimmed Mean	2.5540824		
	Median	2.5649494		
	Variance	.194		
	Std. Deviation	.44085158		
	Minimum	.00000		
	Maximum	2.99573		
	Range	2.99573		
	Interquartile Range	.31015		
	Skewness	-4.264	.096	
	Kurtosis	21.649	.192	
log_G2	Mean	2.4916371	.01321607	
	95% Confidence Interval for Mean	Lower Bound	2.4656856	
		Upper Bound	2.5175886	
	5% Trimmed Mean	2.5189070		
	Median	2.4849066		
	Variance	.113		
	Std. Deviation	.33668582		
	Minimum	.00000		

After log transformation  
Transformed variable shape

**Descriptives**

		Statistic	Std. Error	
	Maximum	2.99573		
	Range	2.99573		
	Interquartile Range	.24116		
	Skewness	-4.371	.096	
	Kurtosis	30.185	.192	
log_G1	Mean	2.4900216	.00977640	
	95% Confidence Interval for Mean	Lower Bound	2.4708244	
		Upper Bound	2.5092189	
	5% Trimmed Mean	2.5002780		
	Median	2.4849066		
	Variance	.062		
	Std. Deviation	.24905835		
	Minimum	.00000		
	Maximum	2.99573		
	Range	2.99573		
	Interquartile Range	.24116		
	Skewness	-1.933	.096	
	Kurtosis	14.983	.192	
log_absences	Mean	1.0886126	.03785194	
	95% Confidence Interval for Mean	Lower Bound	1.0142853	
		Upper Bound	1.1629398	
	5% Trimmed Mean	1.0485242		
	Median	1.0986123		
	Variance	.930		
	Std. Deviation	.96429625		
	Minimum	.00000		
	Maximum	3.49651		
	Range	3.49651		
	Interquartile Range	1.94591		
	Skewness	.181	.096	
	Kurtosis	-1.250	.192	
log_age	Mean	2.8154447	.00282982	

After log transformation  
Transformed variable shape

**Descriptives**

		Statistic	Std. Error
95% Confidence Interval for Mean	Lower Bound	2.8098880	
	Upper Bound	2.8210014	
5% Trimmed Mean		2.8131241	
Median		2.8332133	
Variance		.005	
Std. Deviation		.07209093	
Minimum		2.70805	
Maximum		3.09104	
Range		.38299	
Interquartile Range		.11778	
Skewness		.232	.096
Kurtosis		-.338	.192

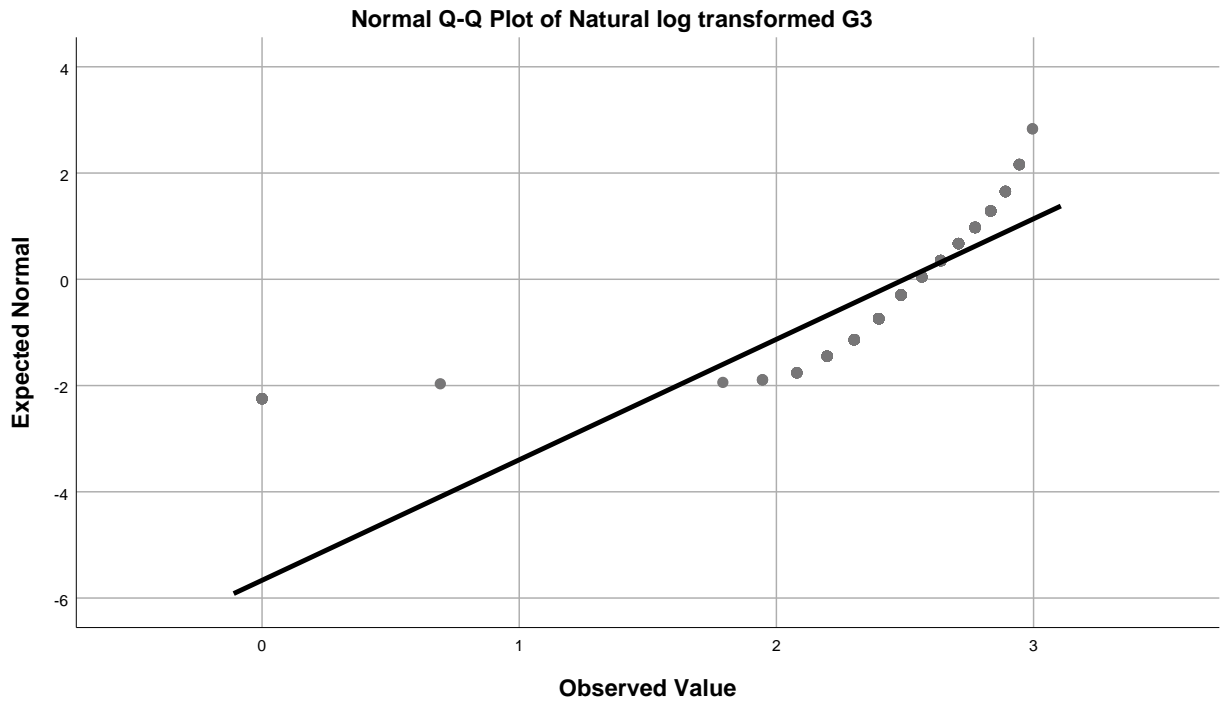
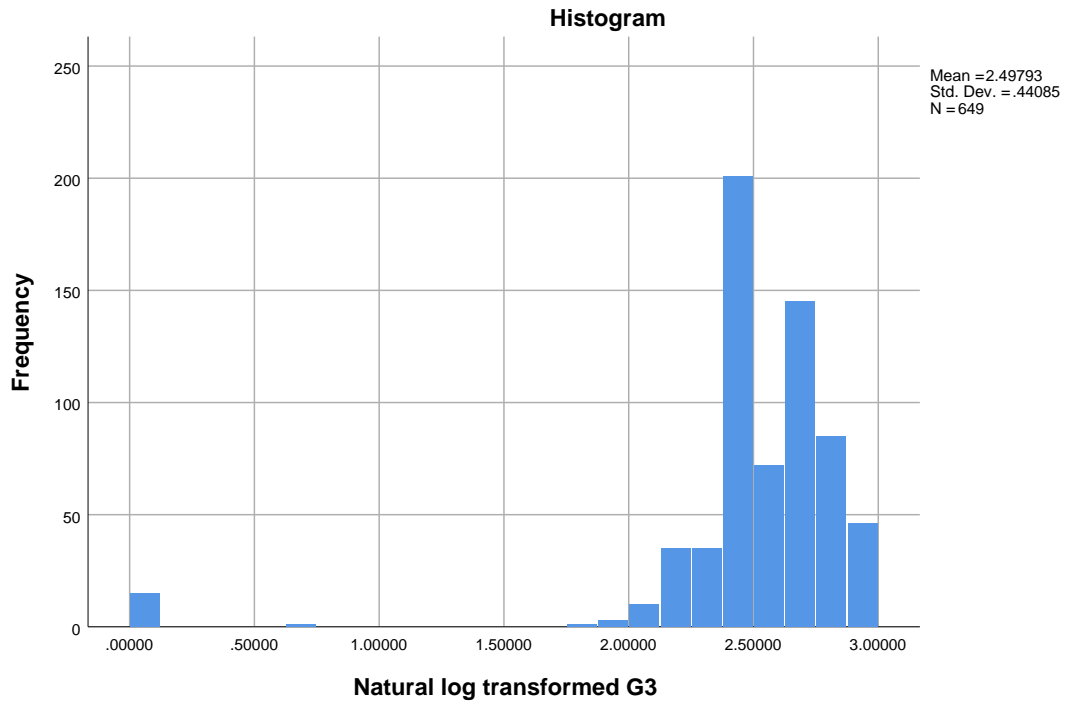
**Tests of Normality**

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
log_G3	.256	649	.000	.561	649	.000
log_G2	.175	649	.000	.662	649	.000
log_G1	.114	649	.000	.899	649	.000
log_absences	.246	649	.000	.870	649	.000
log_age	.169	649	.000	.919	649	.000

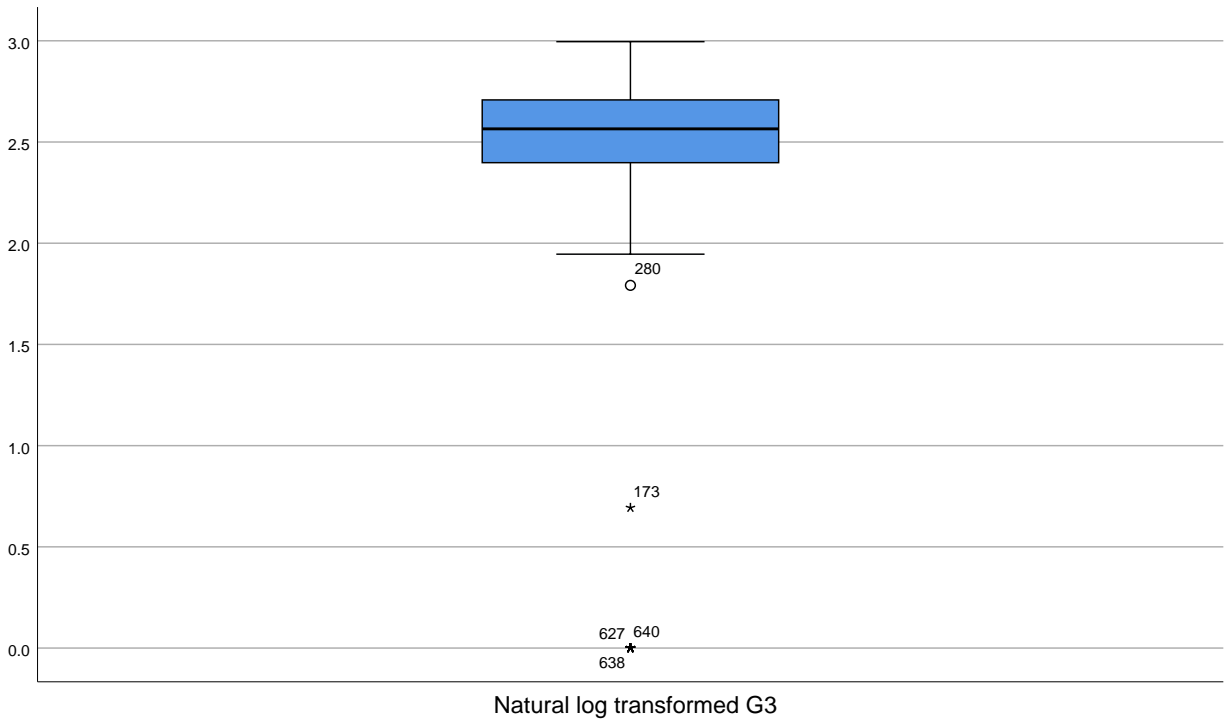
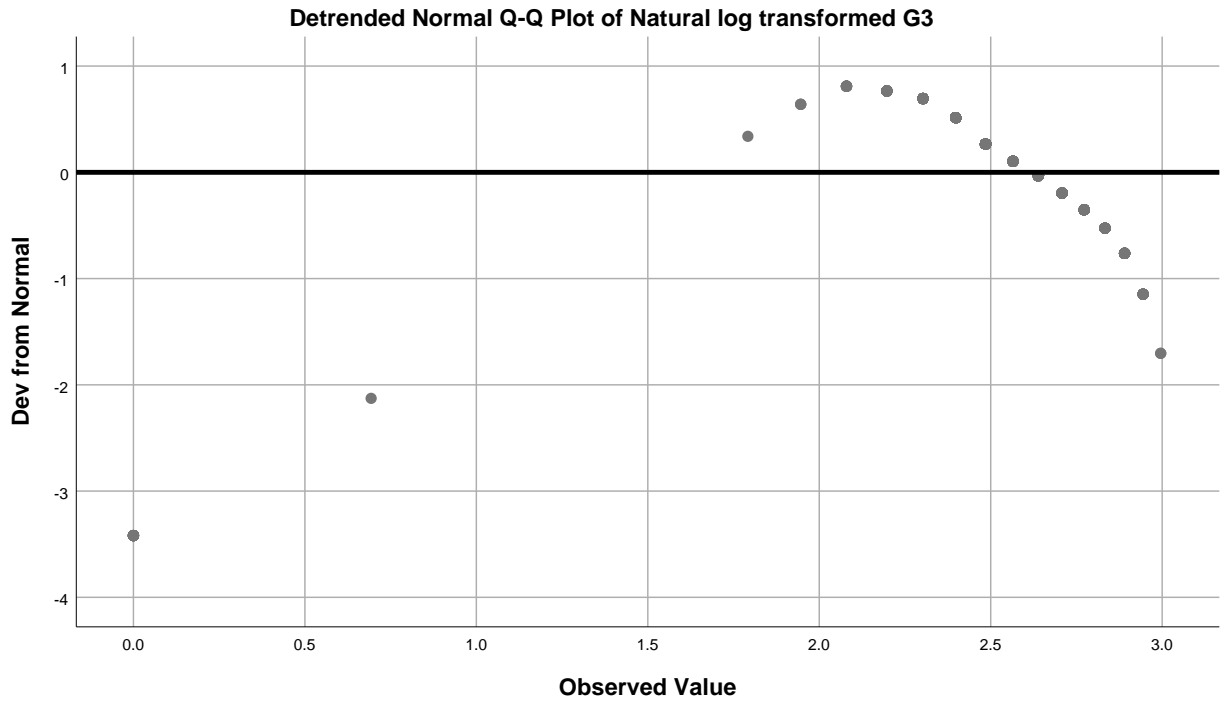
a. Lilliefors Significance Correction

**Natural log transformed G3**

After log transformation  
Transformed variable shape

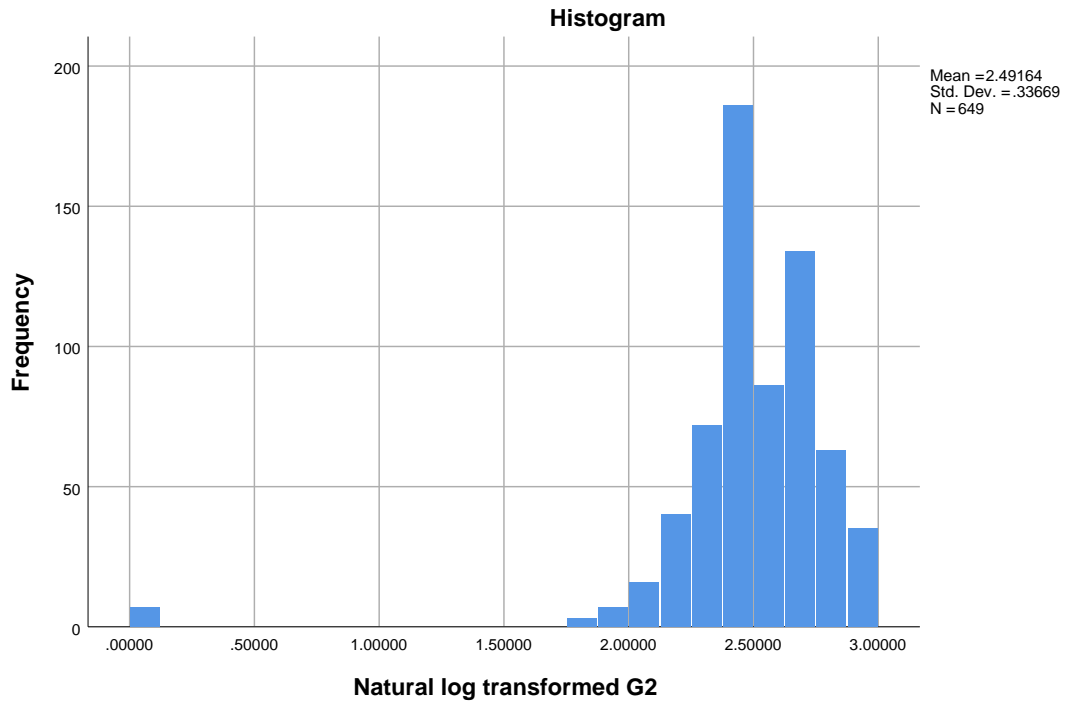


After log transformation  
Transformed variable shape

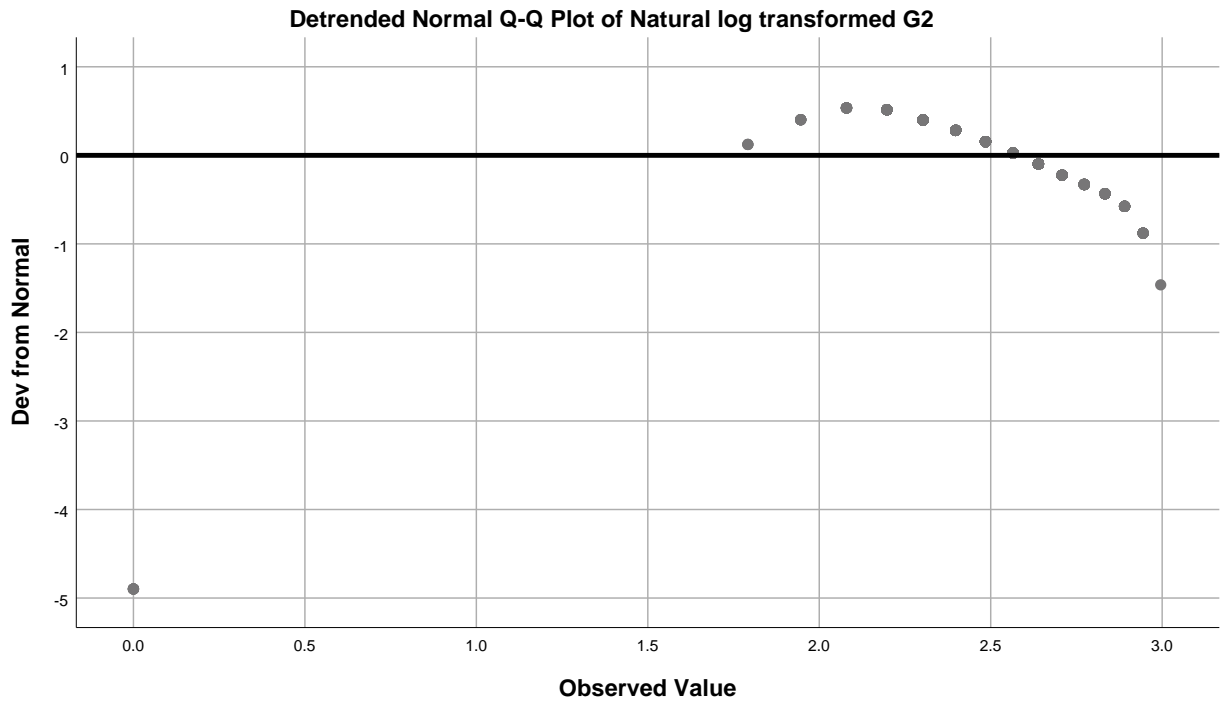
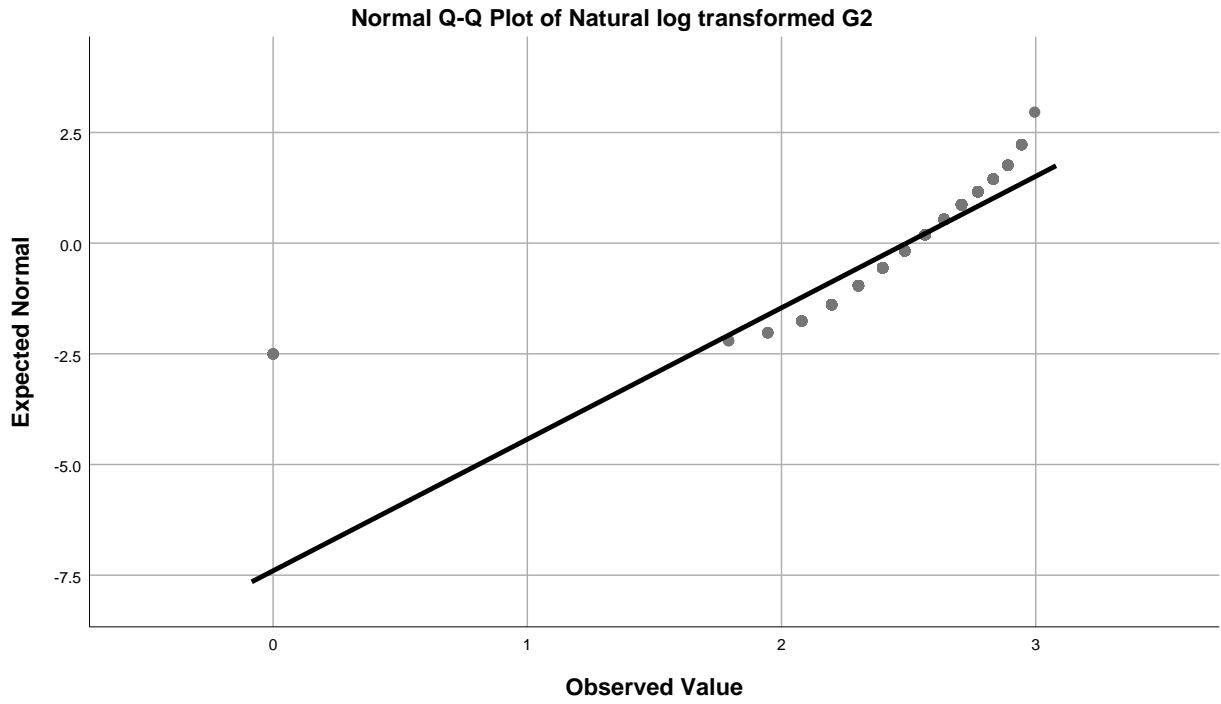


After log transformation  
Transformed variable shape

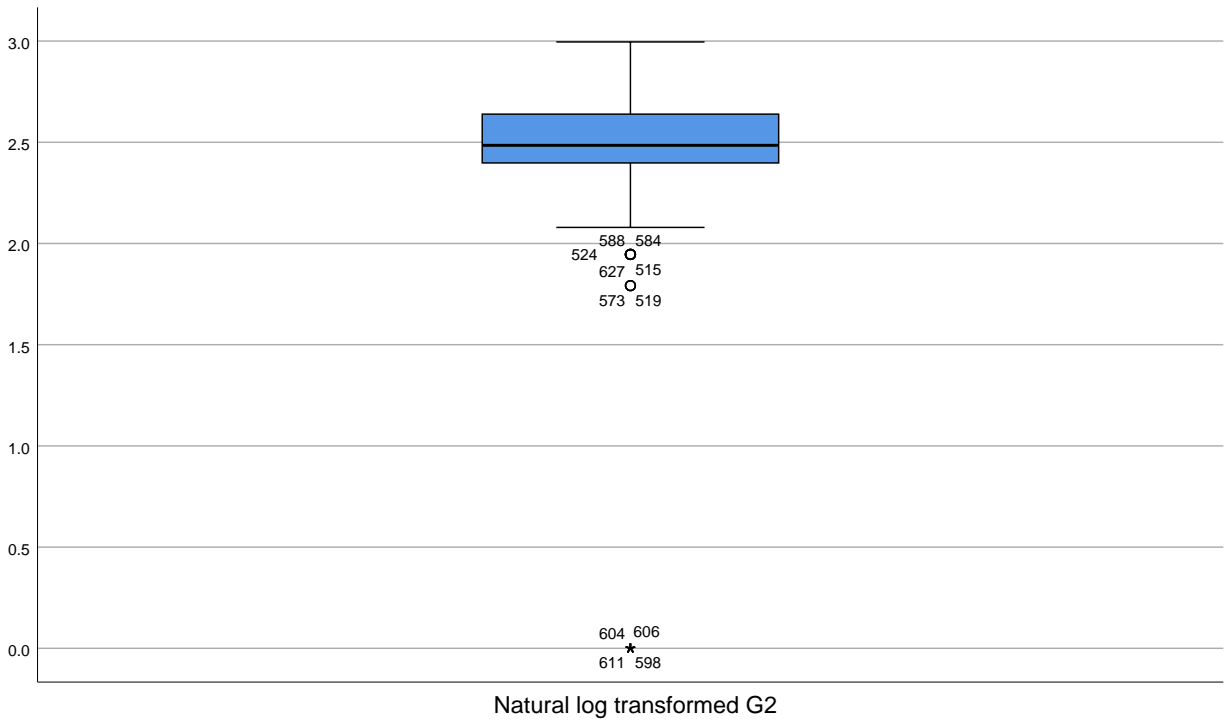
## Natural log transformed G2



After log transformation  
Transformed variable shape

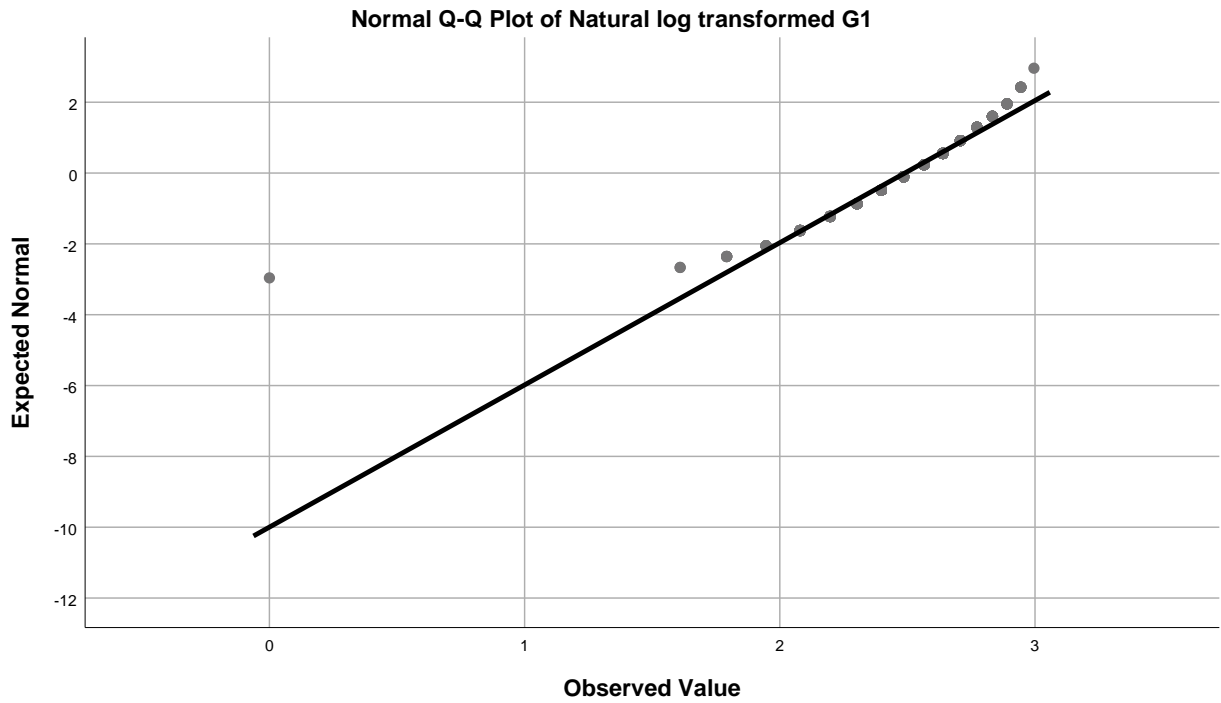
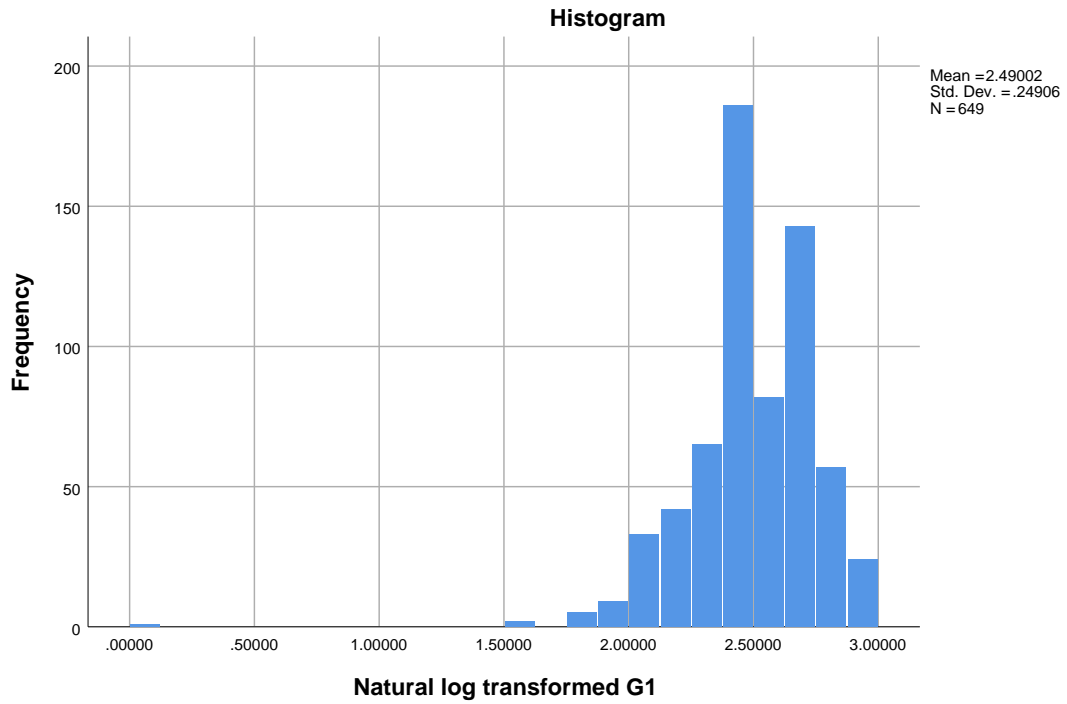


After log transformation  
Transformed variable shape

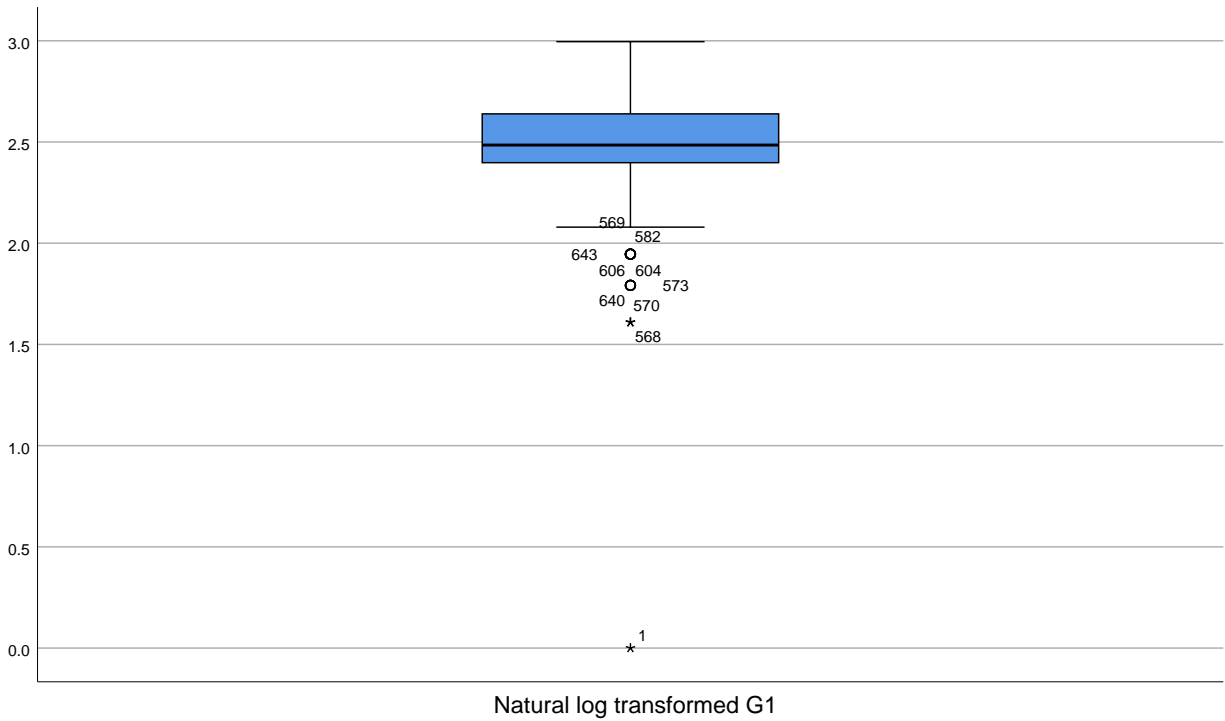
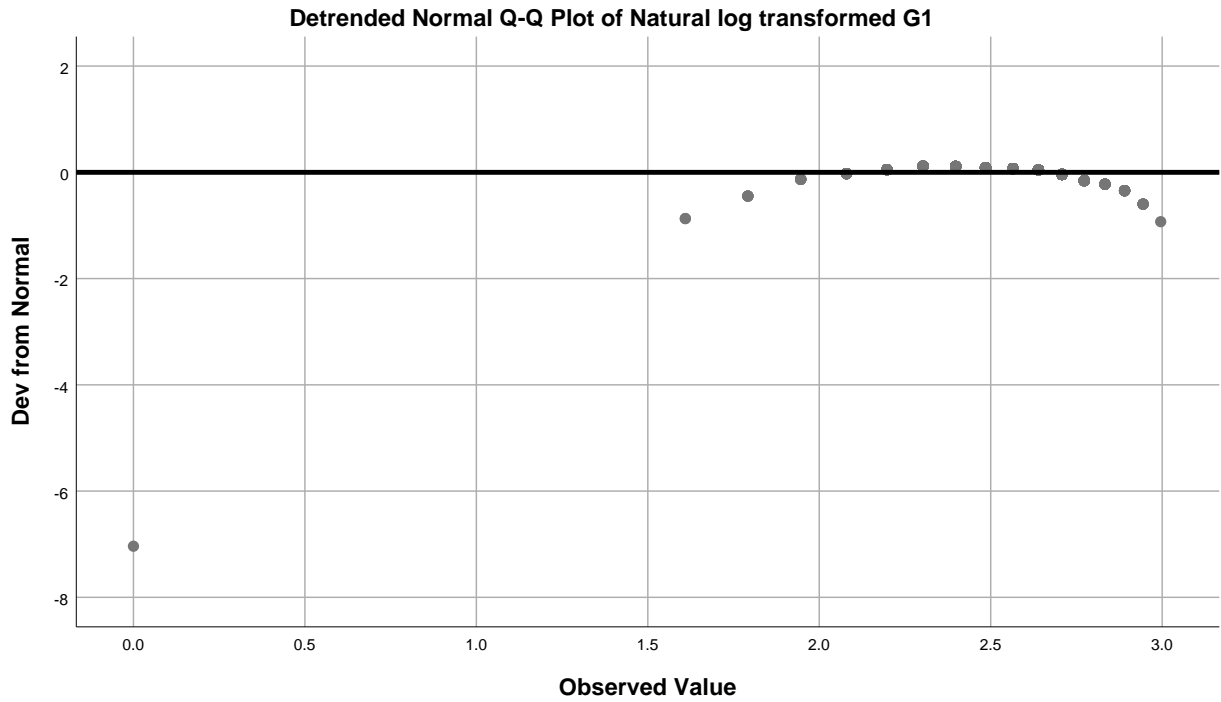


**Natural log transformed G1**

After log transformation  
Transformed variable shape

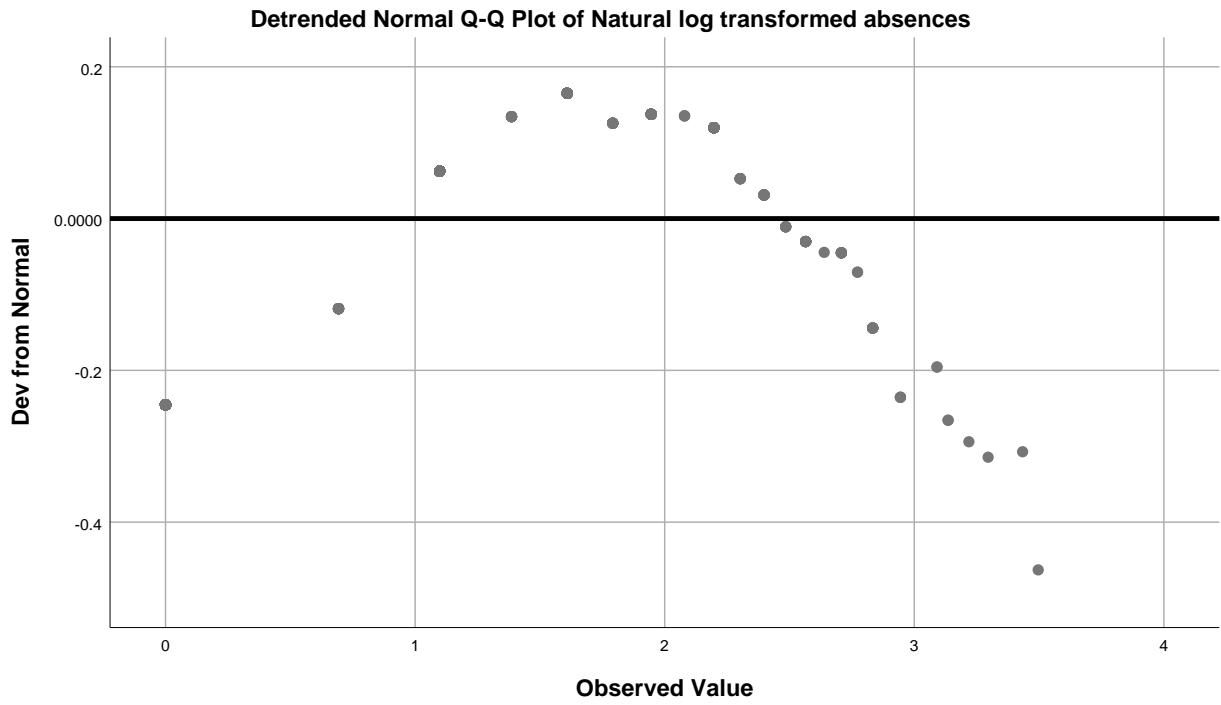
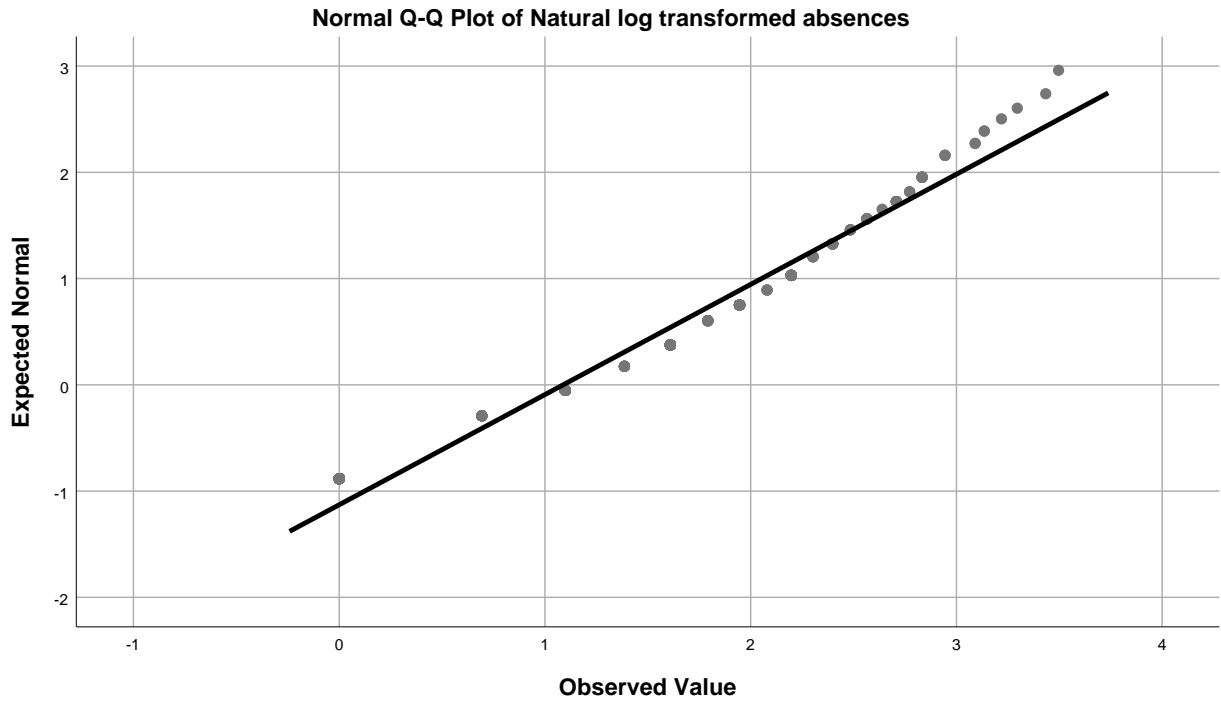


After log transformation  
Transformed variable shape

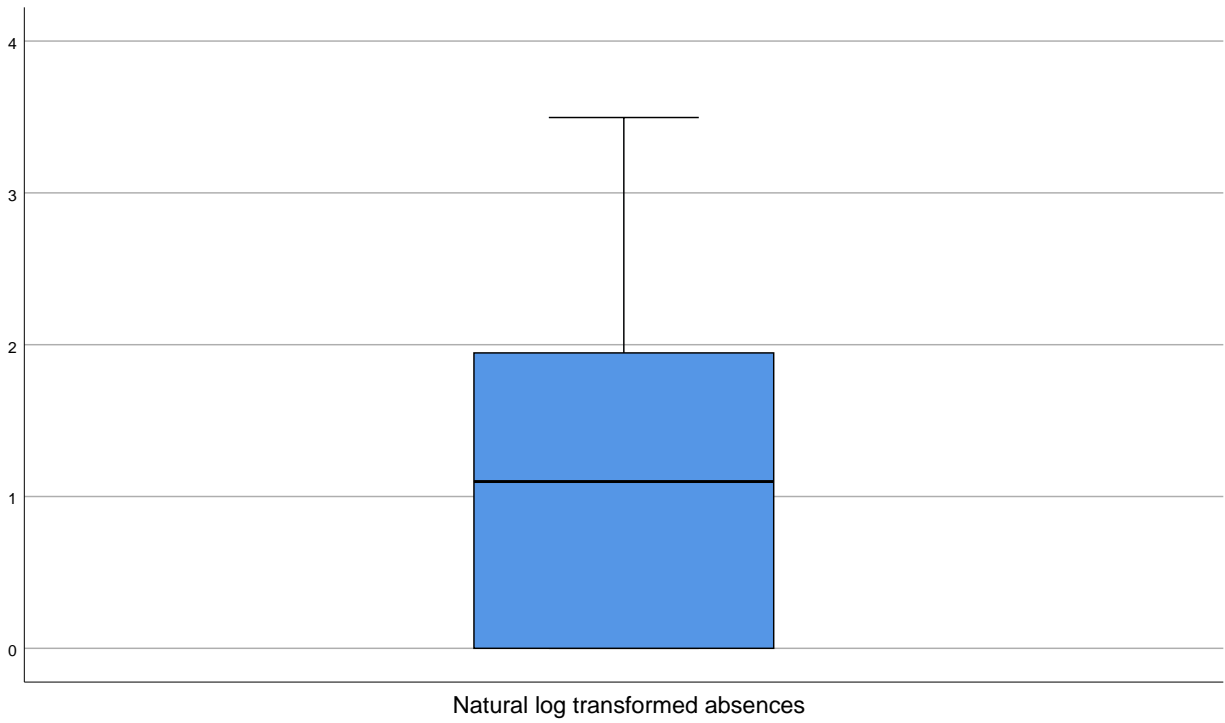




After log transformation  
Transformed variable shape

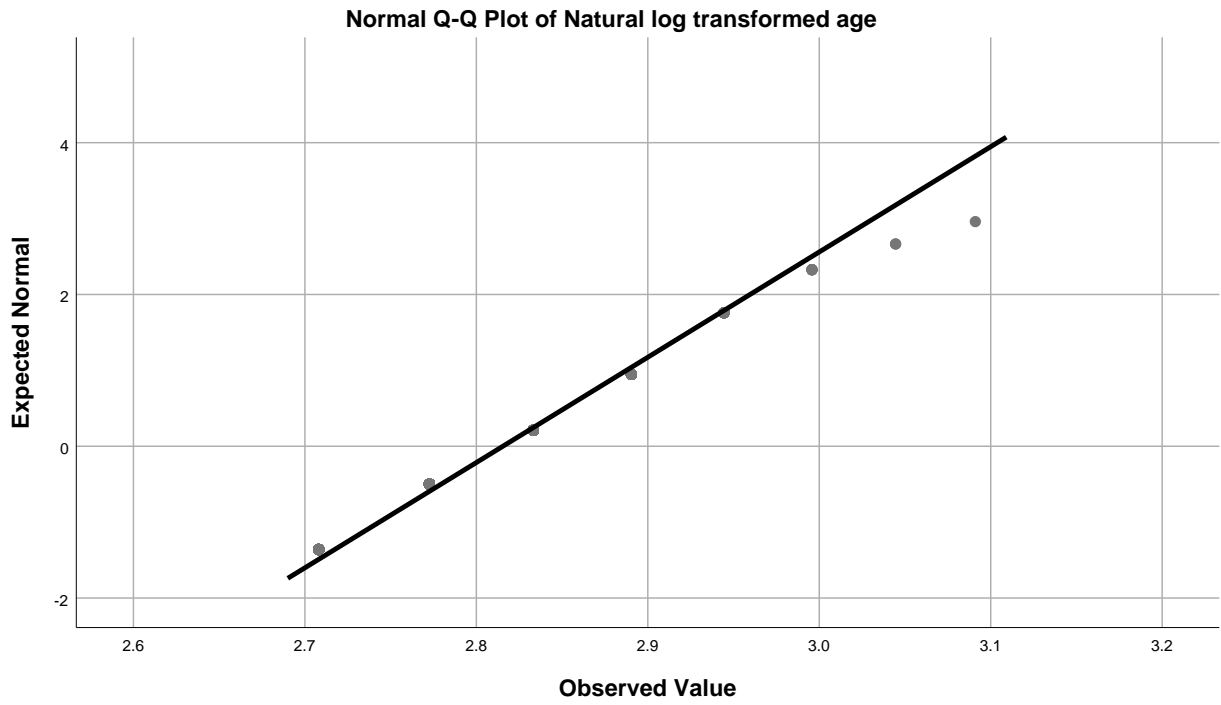
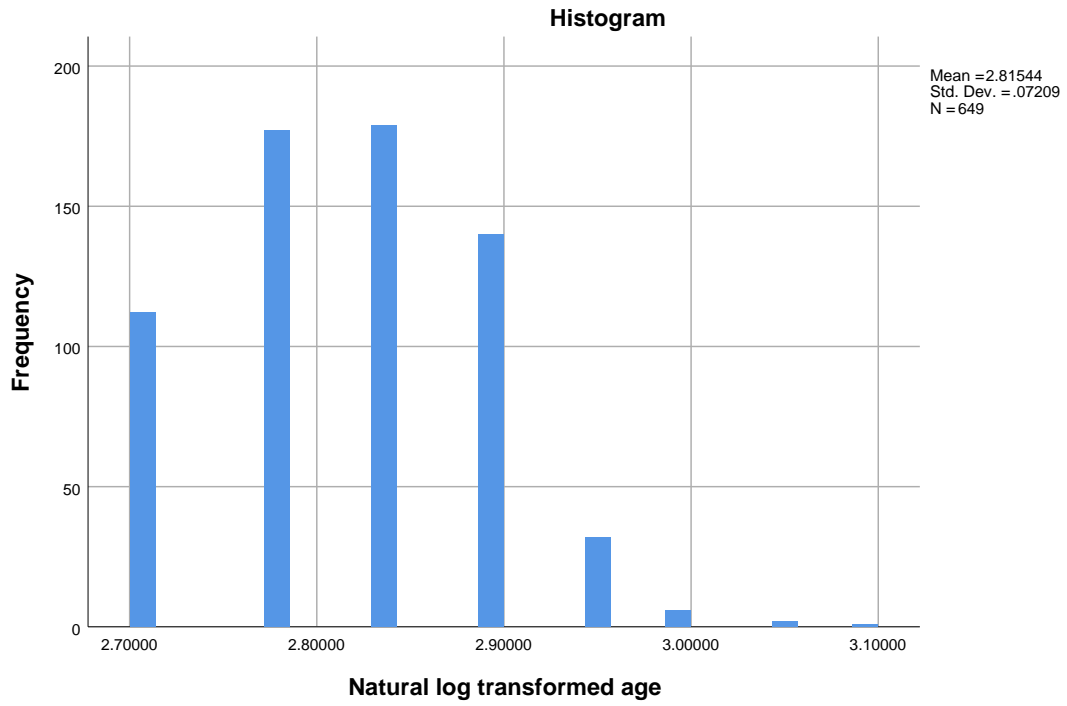


After log transformation  
Transformed variable shape

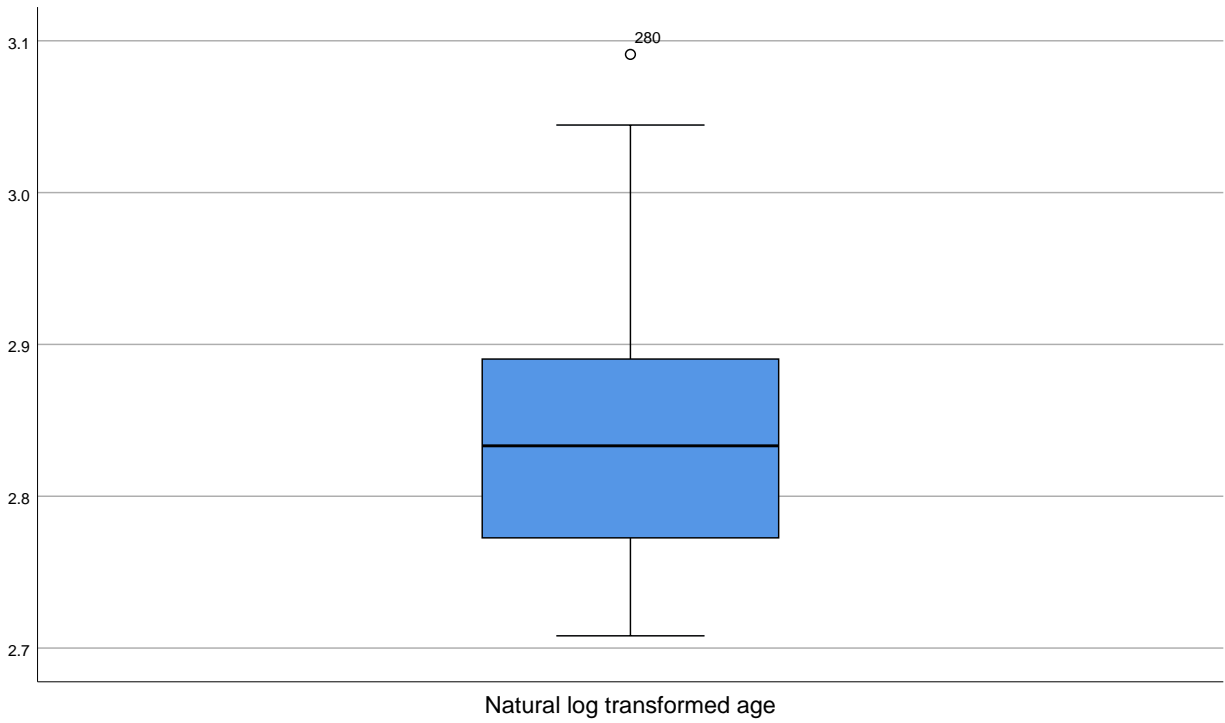
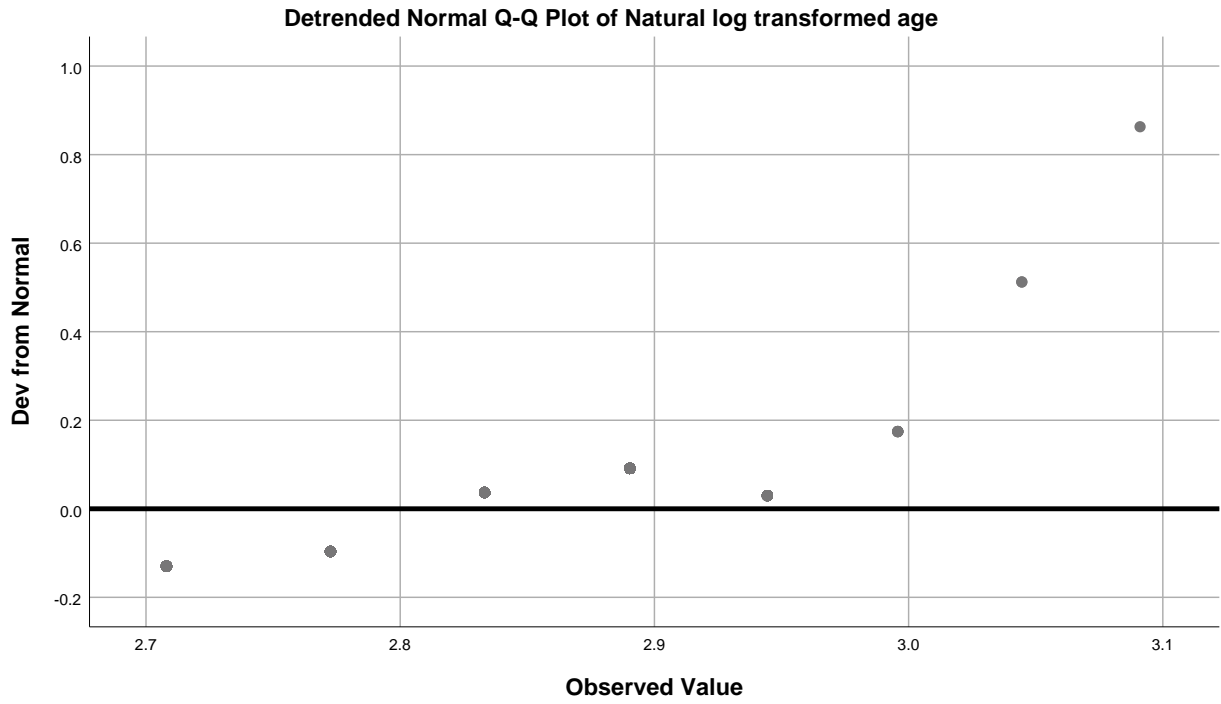


**Natural log transformed age**

After log transformation  
Transformed variable shape



After log transformation  
Transformed variable shape



Before and after descriptives

Before and after descriptives  
Skewness and kurtosis comparison

## Descriptives

### Descriptive Statistics

	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic
G3	649	0	19	11.91	3.231	-.913
log_G3	649	.00000	2.99573	2.4979262	.44085158	-4.264
G2	649	0	19	11.57	2.914	-.360
log_G2	649	.00000	2.99573	2.4916371	.33668582	-4.371
G1	649	0	19	11.40	2.745	-.003
log_G1	649	.00000	2.99573	2.4900216	.24905835	-1.933
absences	649	0	32	3.66	4.641	2.021
log_absences	649	.00000	3.49651	1.0886126	.96429625	.181
age	649	15	22	16.74	1.218	.417
log_age	649	2.70805	3.09104	2.8154447	.07209093	.232
Valid N (listwise)	649					

### Descriptive Statistics

	Skewness	Kurtosis	
	Std. Error	Statistic	Std. Error
G3	.096	2.712	.192
log_G3	.096	21.649	.192
G2	.096	1.662	.192
log_G2	.096	30.185	.192
G1	.096	.037	.192
log_G1	.096	14.983	.192
absences	.096	5.781	.192
log_absences	.096	-1.250	.192
age	.096	.072	.192
log_age	.096	-.338	.192
Valid N (listwise)			

Relationship between original and transformed values

Relationship between original and transformed values  
Correlation

## Correlations

### Correlations

		G3	log_G3	G2	log_G2	G1
G3	Pearson Correlation	1	.888**	.919**	.825**	.826**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	649	649	649	649	649
log_G3	Pearson Correlation	.888**	1	.743**	.816**	.600**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	649	649	649	649	649
G2	Pearson Correlation	.919**	.743**	1	.892**	.865**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	649	649	649	649	649
log_G2	Pearson Correlation	.825**	.816**	.892**	1	.687**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	649	649	649	649	649
G1	Pearson Correlation	.826**	.600**	.865**	.687**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	649	649	649	649	649
log_G1	Pearson Correlation	.770**	.584**	.796**	.659**	.960**
	Sig. (2-tailed)	.000	.000	.000	.000	.000
	N	649	649	649	649	649
absences	Pearson Correlation	-.091*	.014	-.125**	-.045	-.147**
	Sig. (2-tailed)	.020	.729	.001	.255	.000
	N	649	649	649	649	649
log_absences	Pearson Correlation	-.073	.056	-.125**	-.025	-.168**
	Sig. (2-tailed)	.062	.156	.001	.521	.000
	N	649	649	649	649	649

Relationship between original and transformed values  
Correlation

**Correlations**

		log_G1	absences	log_absences
G3	Pearson Correlation	.770**	-.091*	-.073
	Sig. (2-tailed)	.000	.020	.062
	N	649	649	649
log_G3	Pearson Correlation	.584**	.014	.056
	Sig. (2-tailed)	.000	.729	.156
	N	649	649	649
G2	Pearson Correlation	.796**	-.125**	-.125**
	Sig. (2-tailed)	.000	.001	.001
	N	649	649	649
log_G2	Pearson Correlation	.659**	-.045	-.025
	Sig. (2-tailed)	.000	.255	.521
	N	649	649	649
G1	Pearson Correlation	.960**	-.147**	-.168**
	Sig. (2-tailed)	.000	.000	.000
	N	649	649	649
log_G1	Pearson Correlation	1	-.128**	-.149**
	Sig. (2-tailed)		.001	.000
	N	649	649	649
absences	Pearson Correlation	-.128**	1	.892**
	Sig. (2-tailed)	.001		.000
	N	649	649	649
log_absences	Pearson Correlation	-.149**	.892**	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).

Group context after transformation

Group context after transformation  
G3 and log\_G3 by sex

## Means

### Case Processing Summary

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
G3 * sex	649	100.0%	0	0.0%	649	100.0%
log_G3 * sex	649	100.0%	0	0.0%	649	100.0%

### Report

sex		G3	log_G3
F	N	383	383
	Mean	12.25	2.5341606
	Std. Deviation	3.124	.39995833
	Variance	9.760	.160
M	N	266	266
	Mean	11.41	2.4457541
	Std. Deviation	3.321	.48991615
	Variance	11.027	.240
Total	N	649	649
	Mean	11.91	2.4979262
	Std. Deviation	3.231	.44085158
	Variance	10.437	.194