

**Host**

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## Square Root Transformation

Before square root transformation

**Explore**

[SquareRootTransformationData] D:\DATA ANALYSIS\B Normality and Assumption Tests\Square Root Transformation\SPSS\_Output\sav\Square-Root-Transformation-data.sav

**Case Processing Summary**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
absences	649	100.0%	0	0.0%	649	100.0%
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%
age	649	100.0%	0	0.0%	649	100.0%
failures	649	100.0%	0	0.0%	649	100.0%

**Descriptives**

		Statistic	Std. Error	
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	
G3	Mean	11.91	.127	
	95% Confidence Interval for Mean	Lower Bound	11.66	
		Upper Bound	12.16	
5% Trimmed Mean	12.06			

Before square root transformation

### Descriptives

		Statistic	Std. Error	
	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		
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		

Before square root transformation

### Descriptives

		Statistic	Std. Error	
age	Skewness	-.003	.096	
	Kurtosis	.037	.192	
	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	
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		
	Interquartile Range	0		
	Skewness	3.093	.096	
	Kurtosis	9.824	.192	

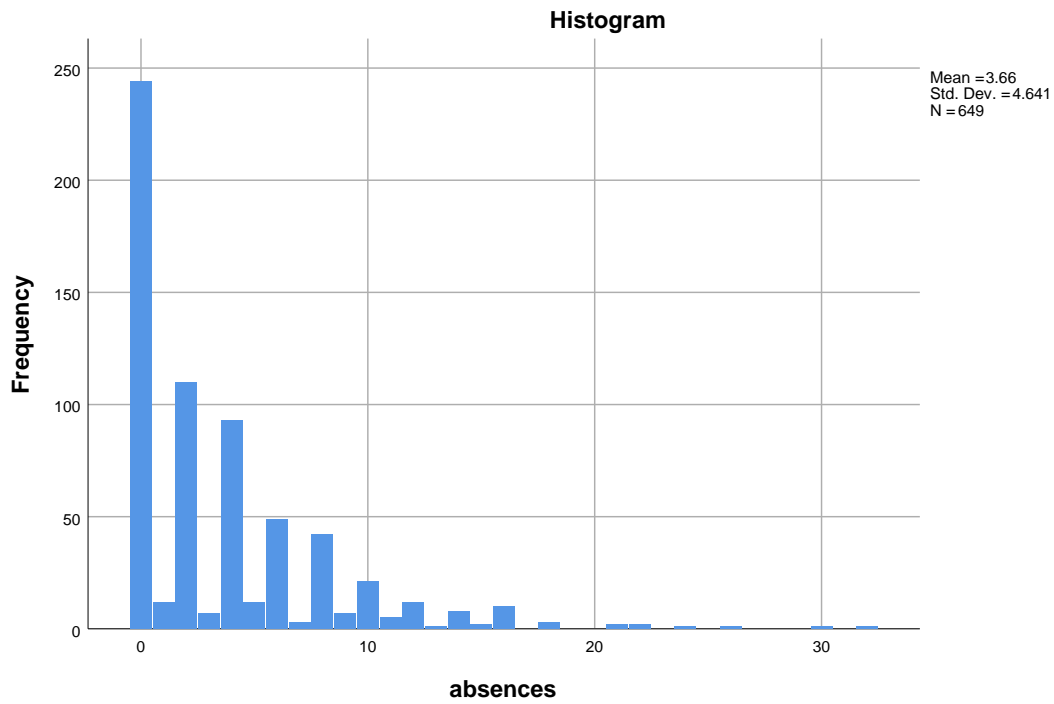
Before square root transformation

### Tests of Normality

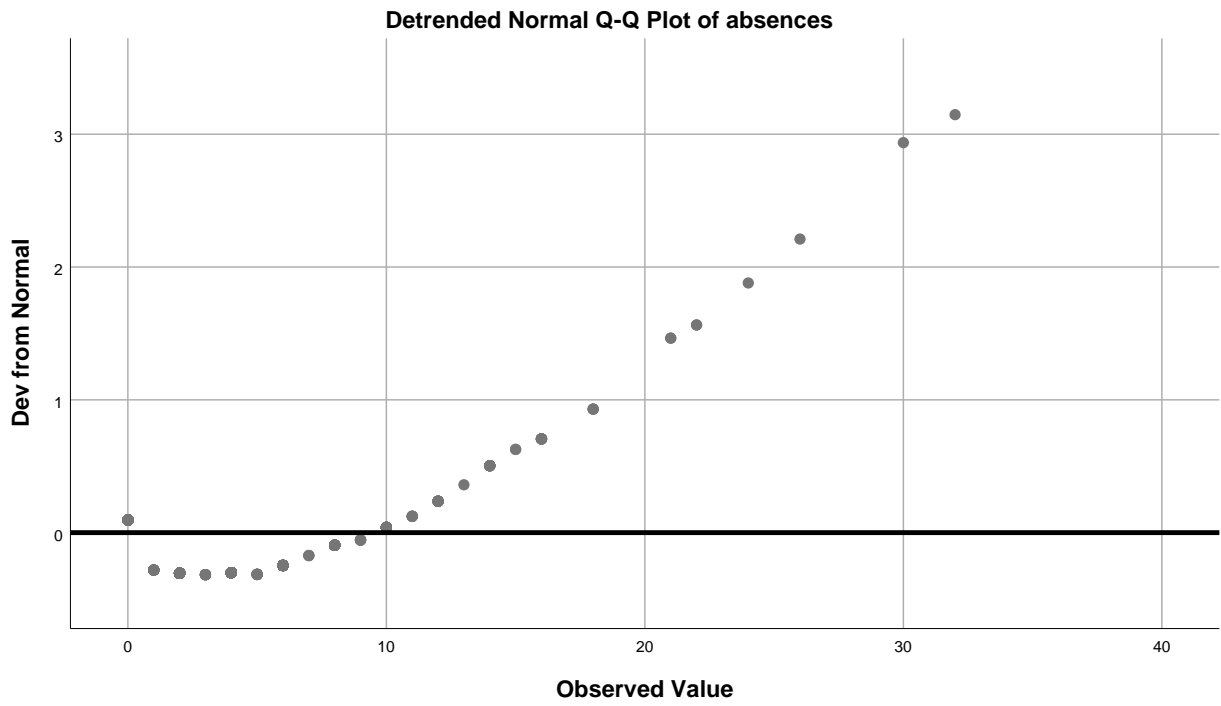
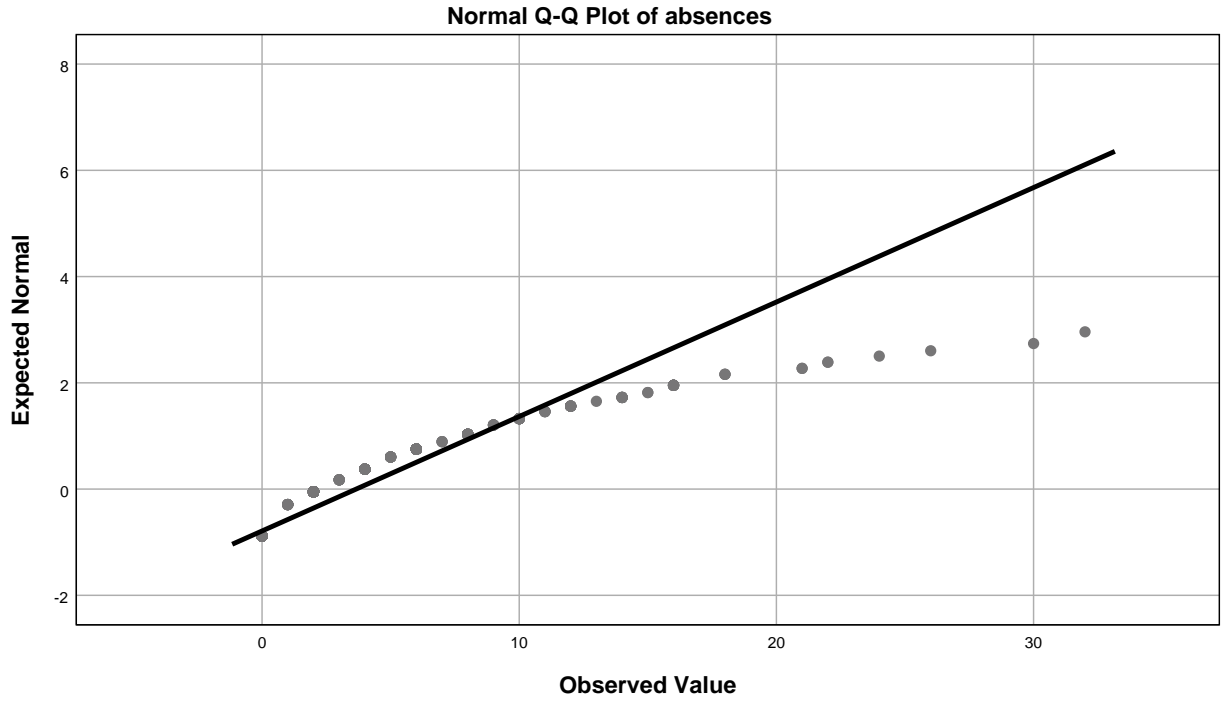
	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
absences	.215	649	.000	.772	649	.000
G3	.124	649	.000	.926	649	.000
G2	.088	649	.000	.962	649	.000
G1	.086	649	.000	.986	649	.000
age	.175	649	.000	.916	649	.000
failures	.492	649	.000	.424	649	.000

a. Lilliefors Significance Correction

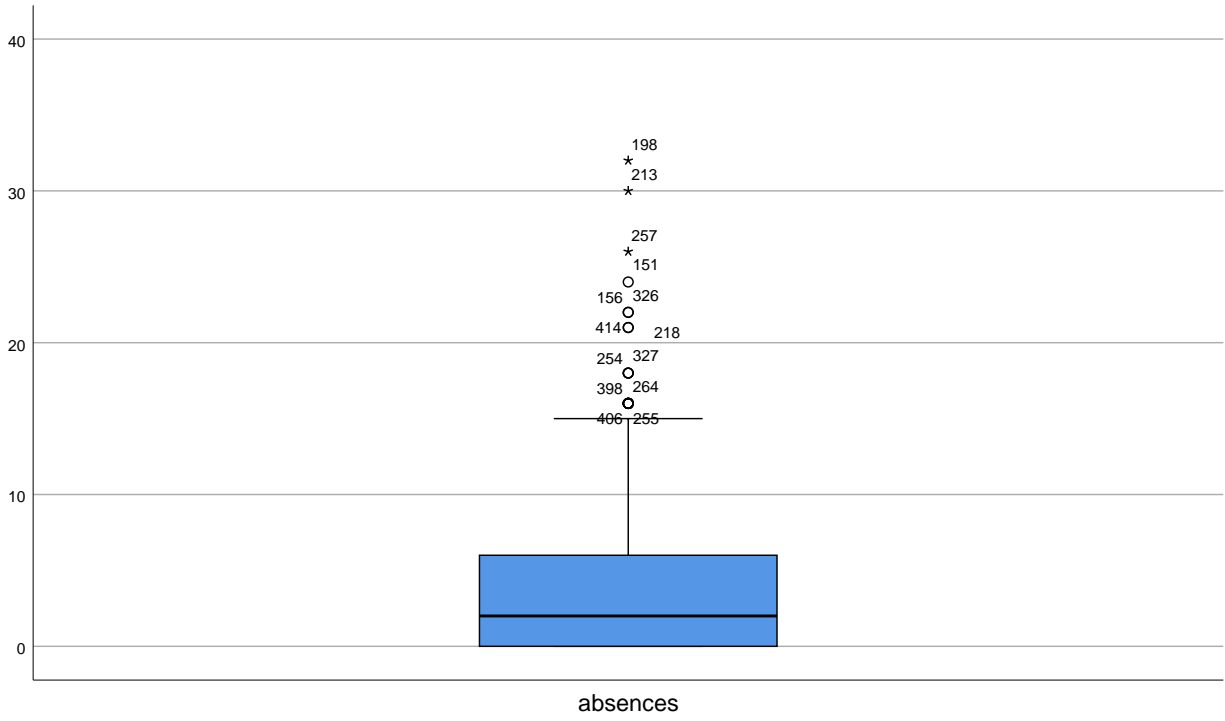
### absences



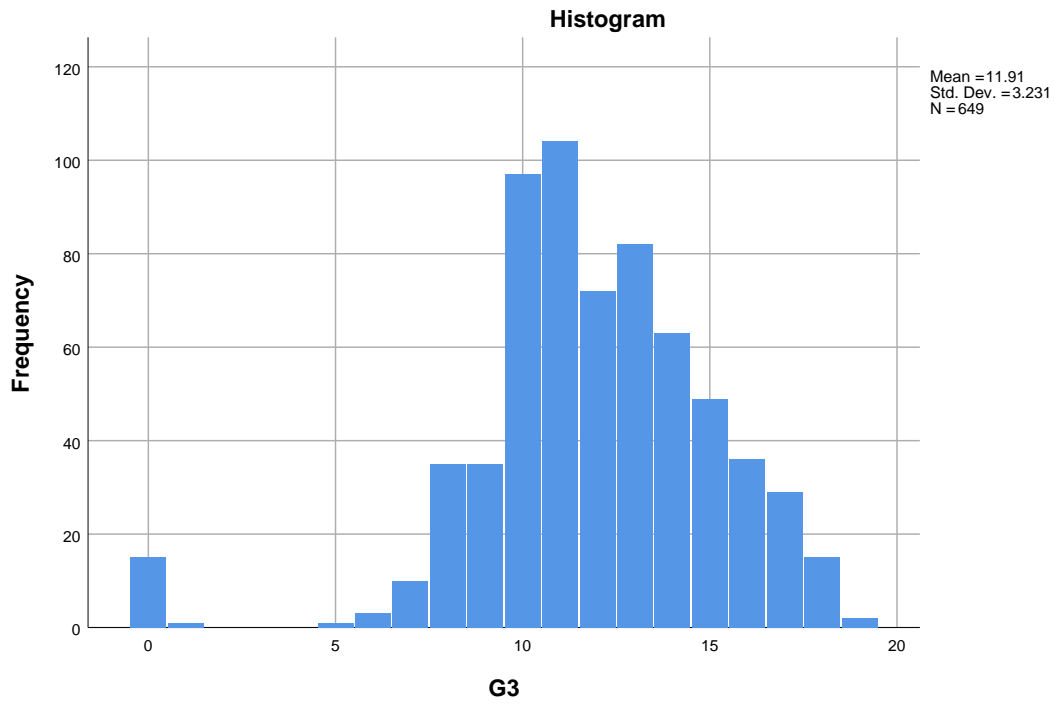
Before square root transformation



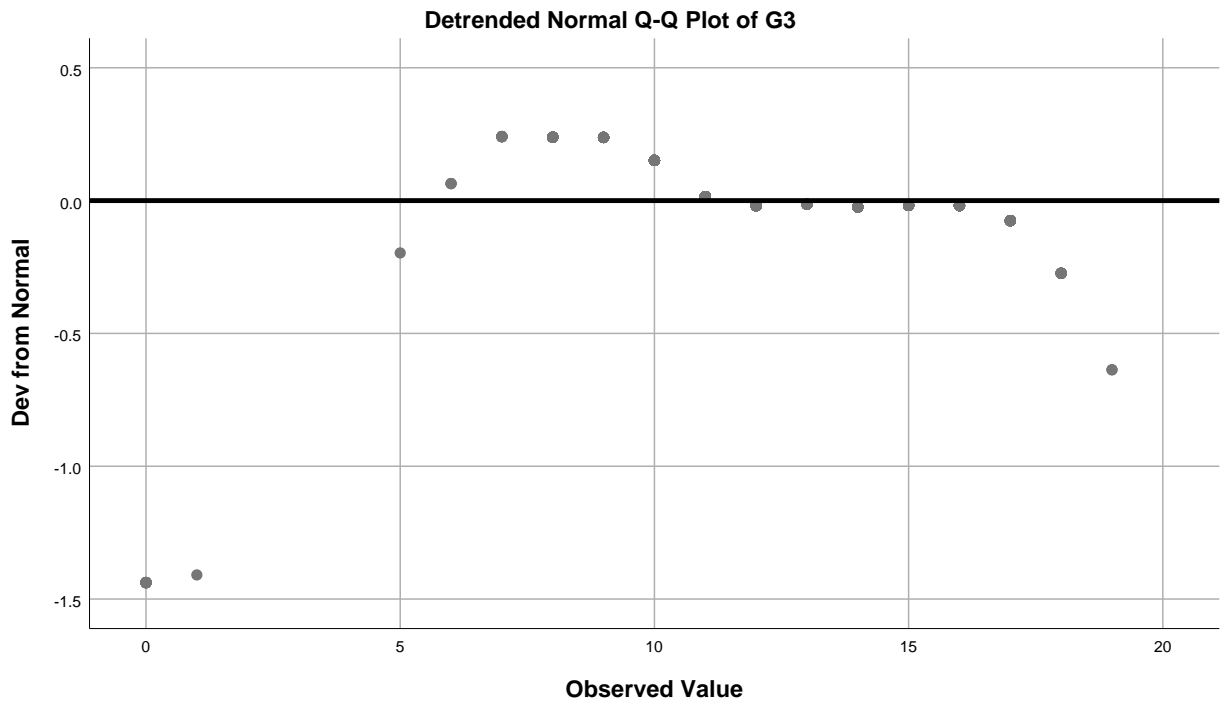
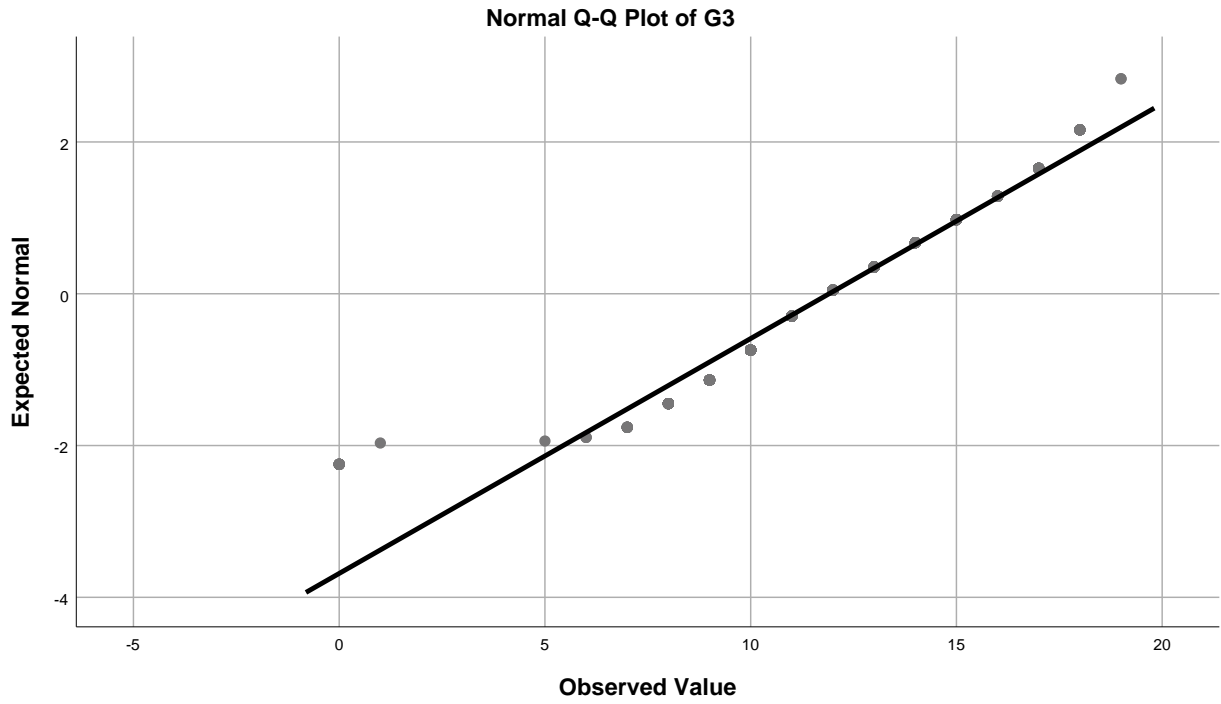
Before square root transformation



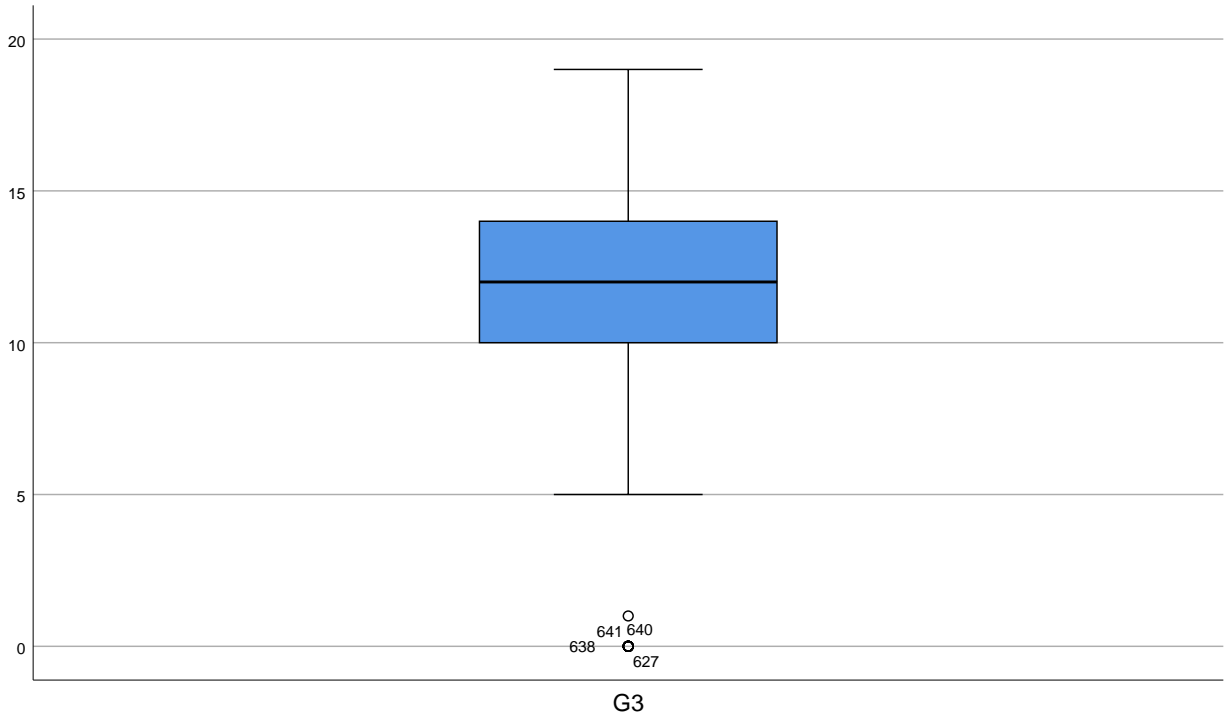
**G3**



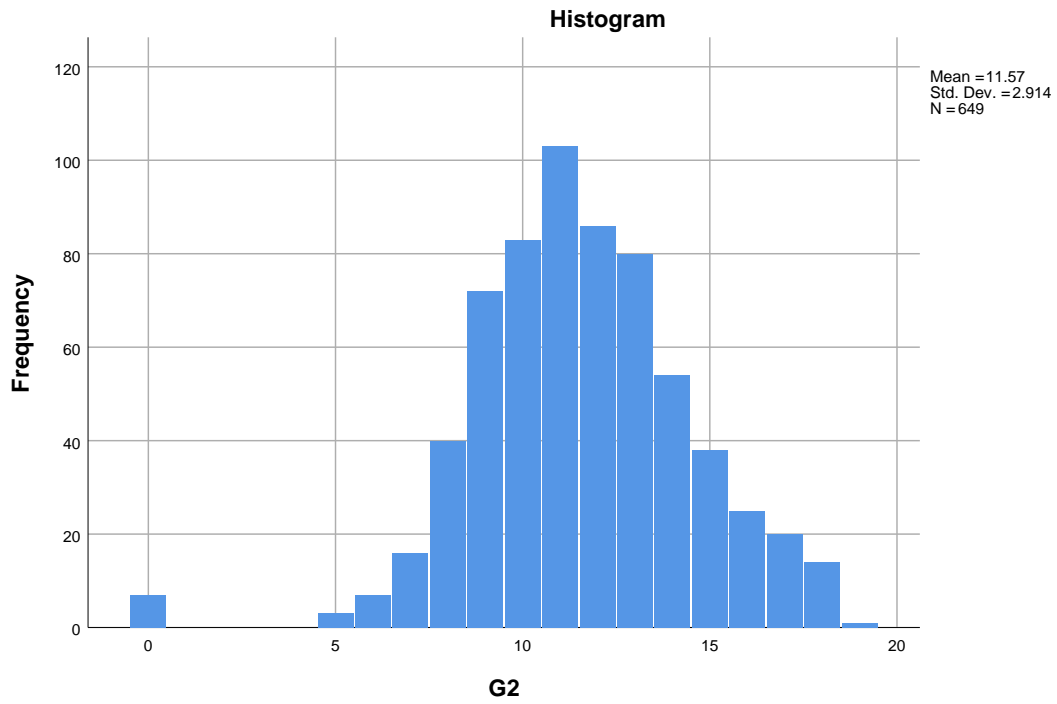
Before square root transformation



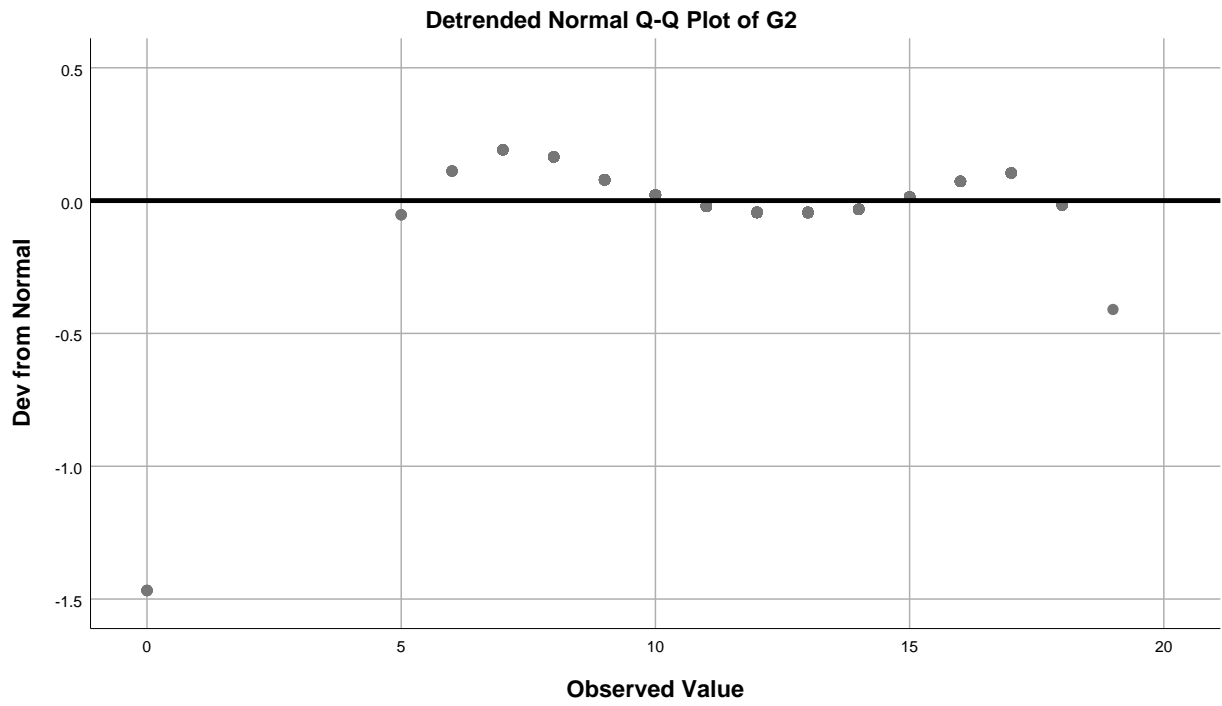
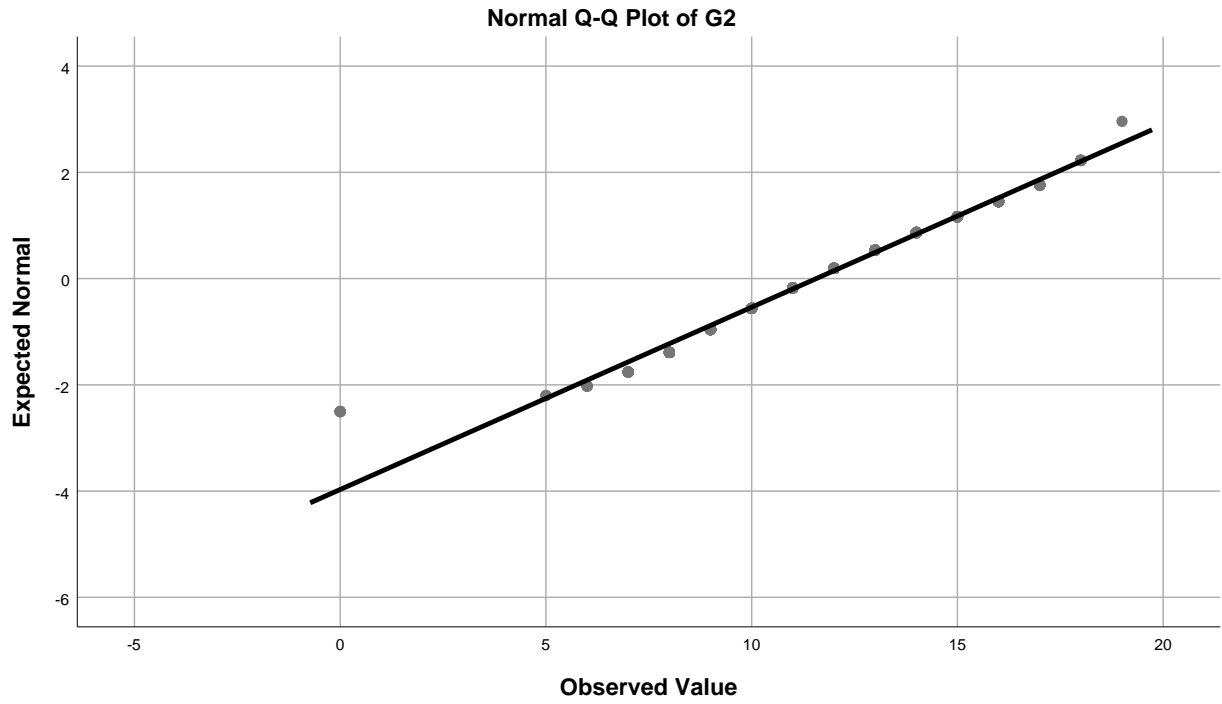
Before square root transformation



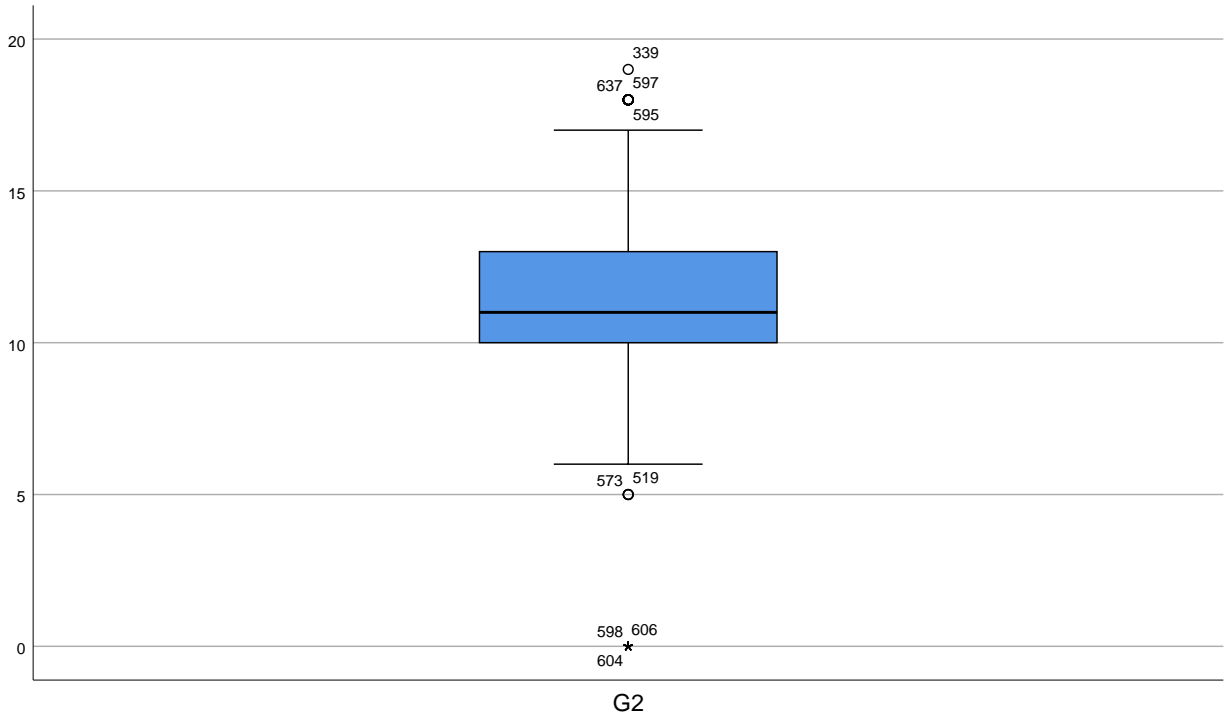
**G2**



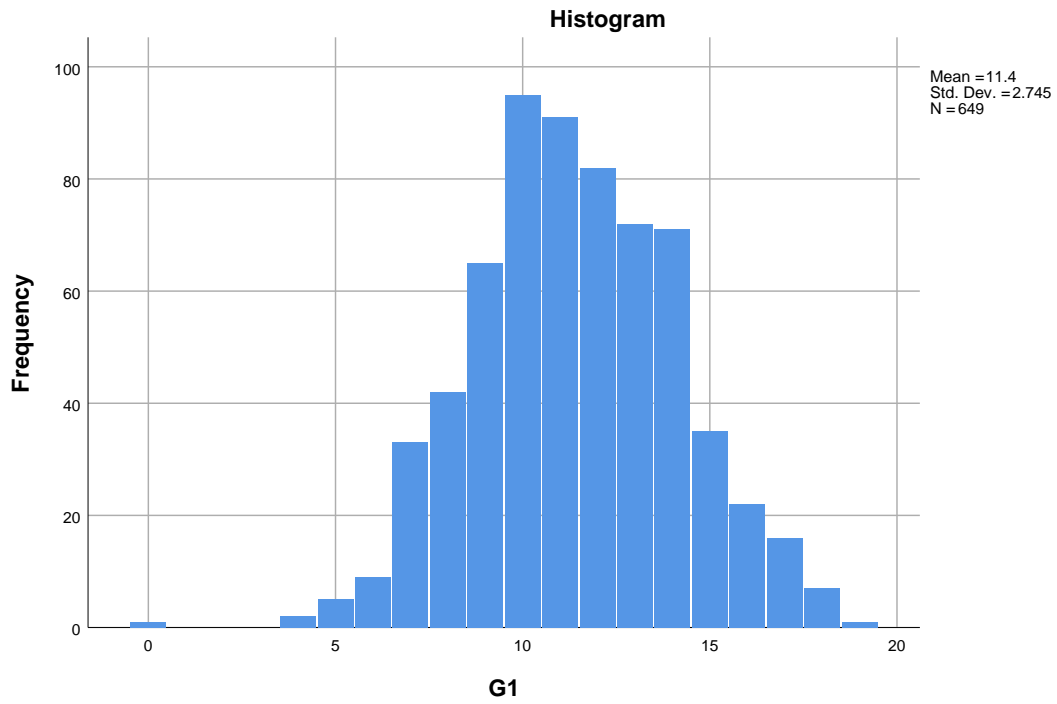
Before square root transformation



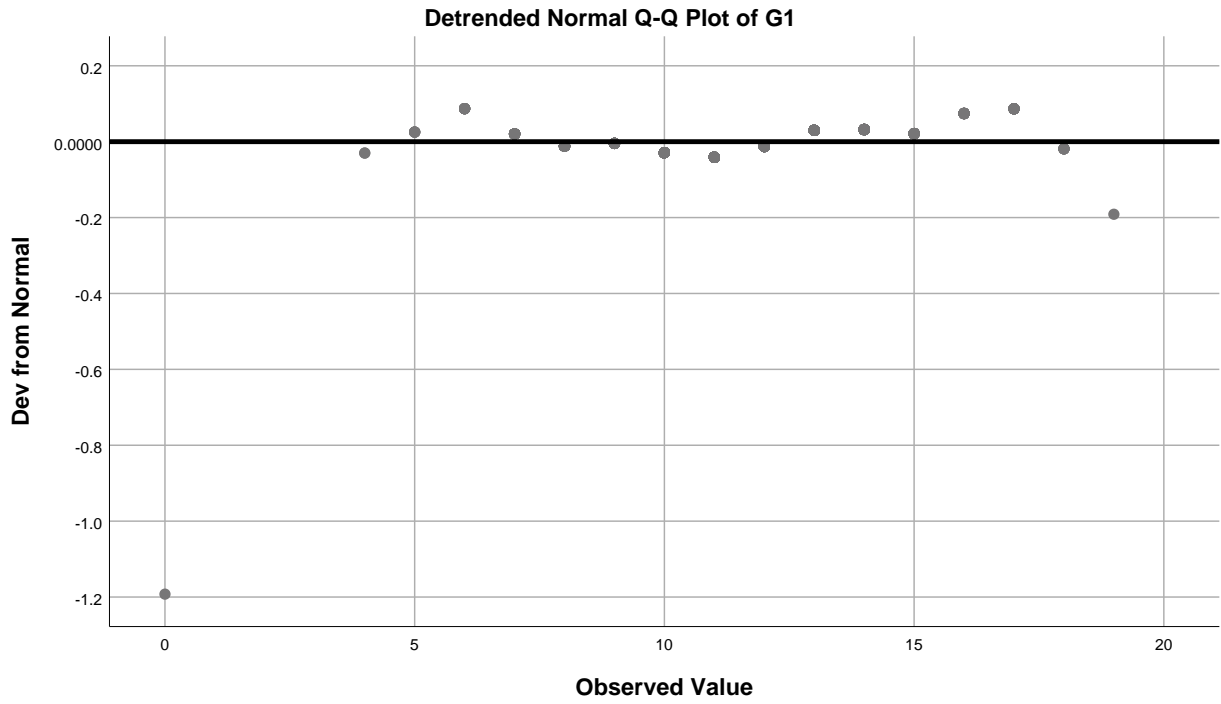
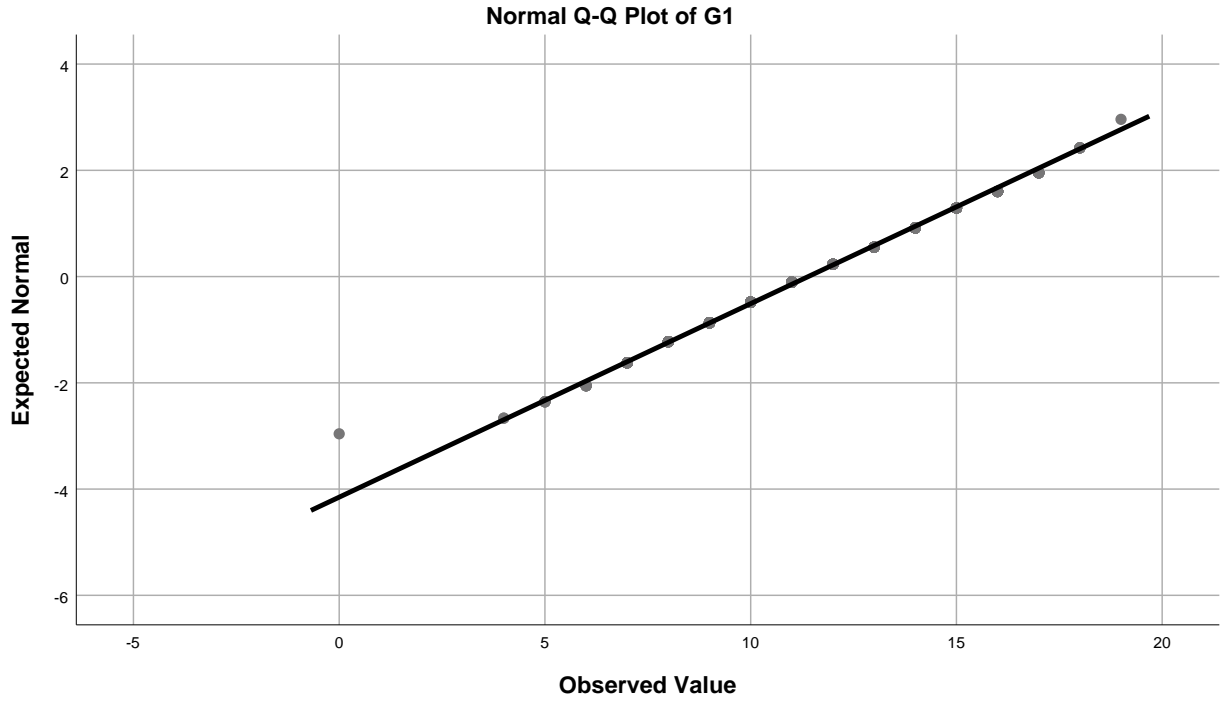
Before square root transformation



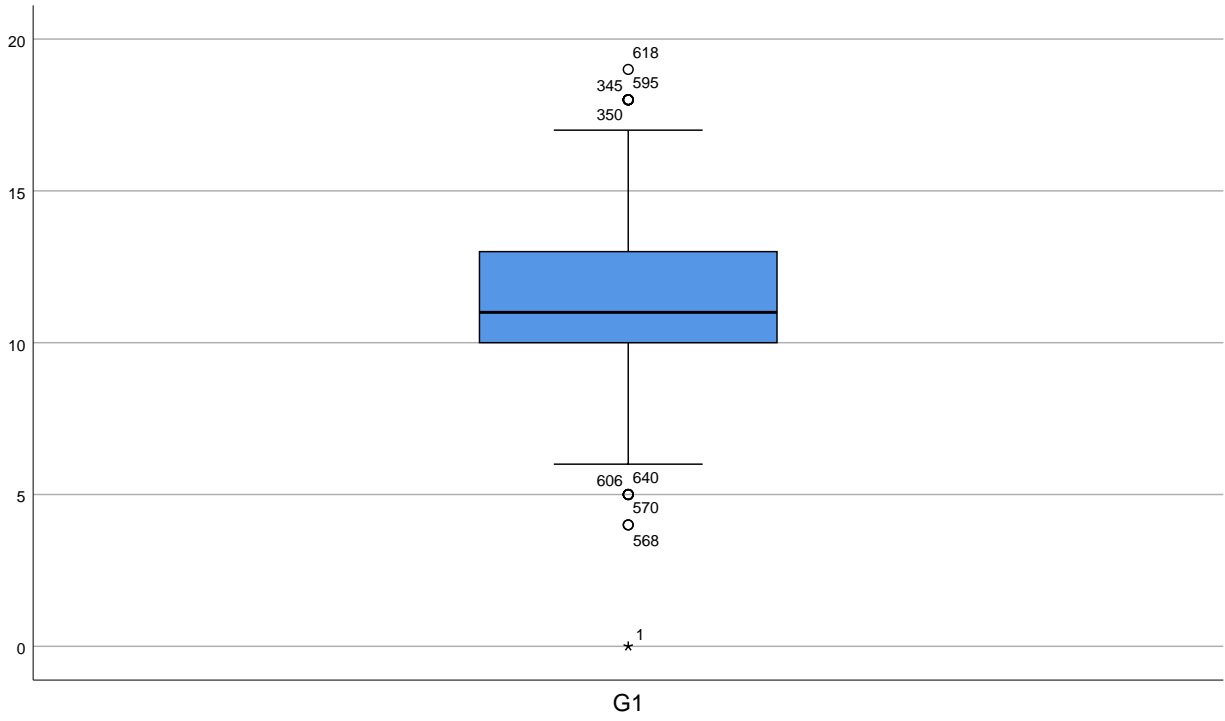
G1



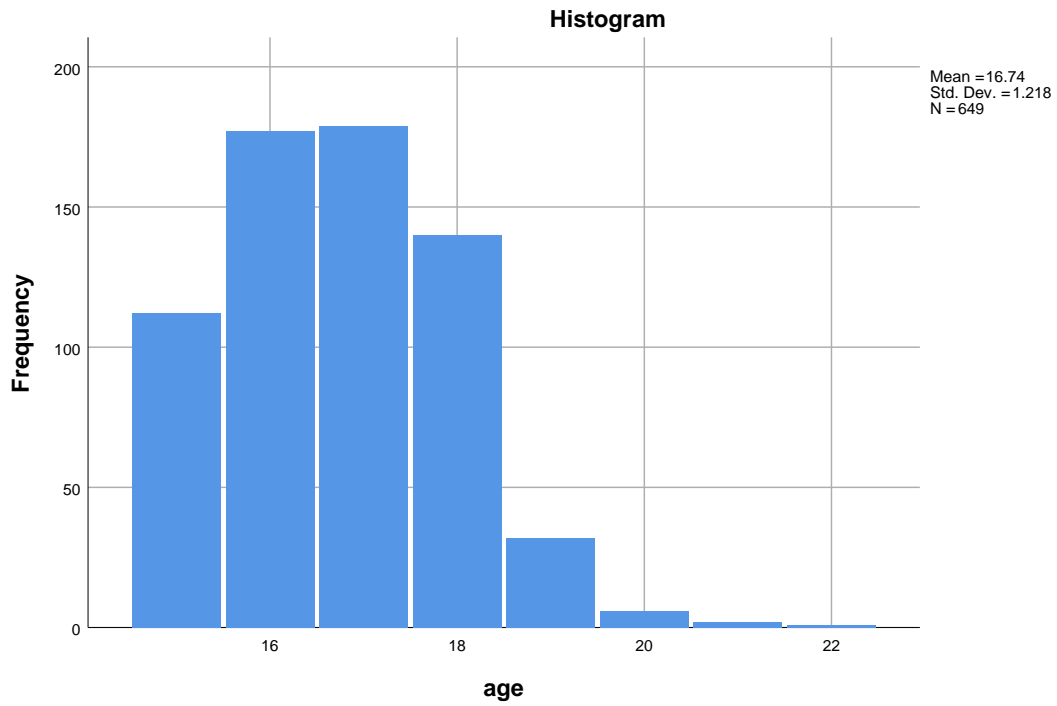
Before square root transformation



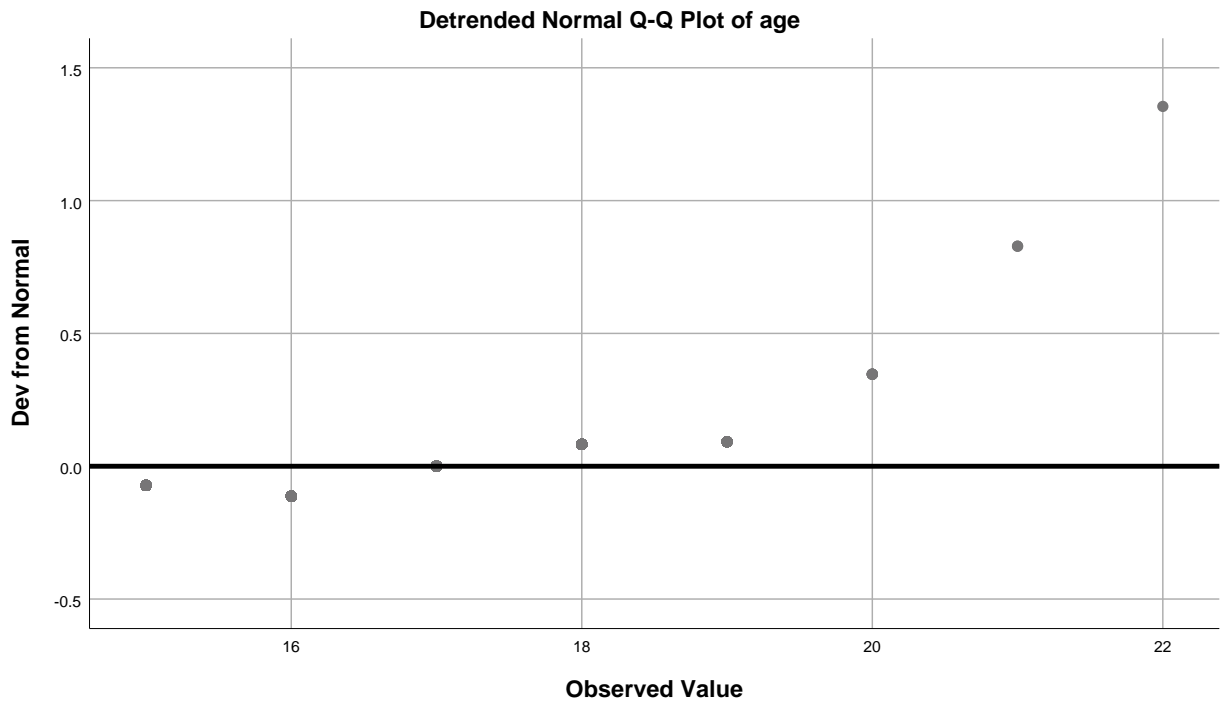
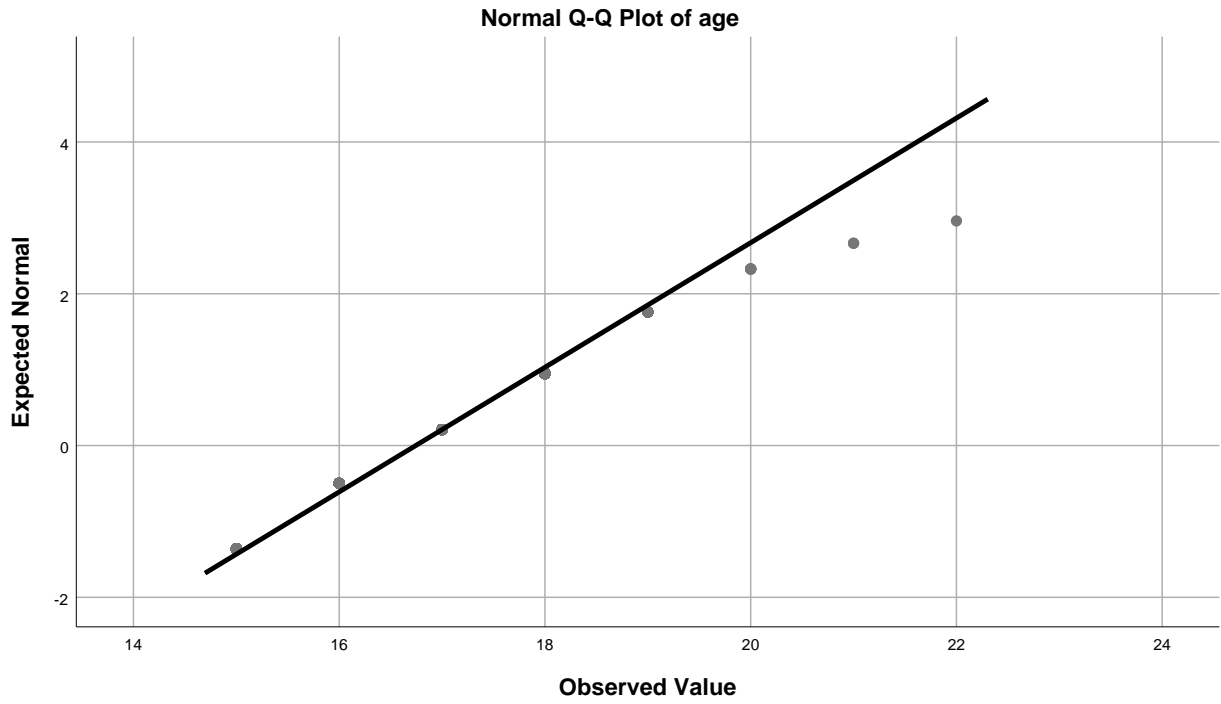
Before square root transformation



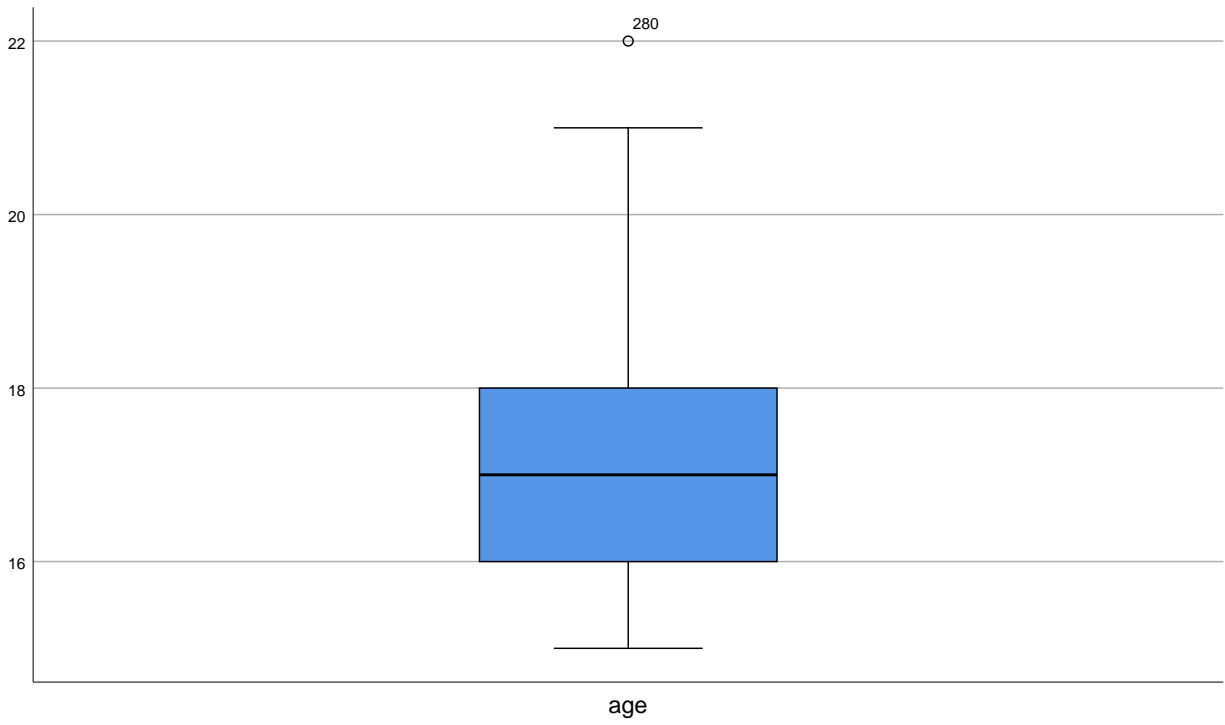
age



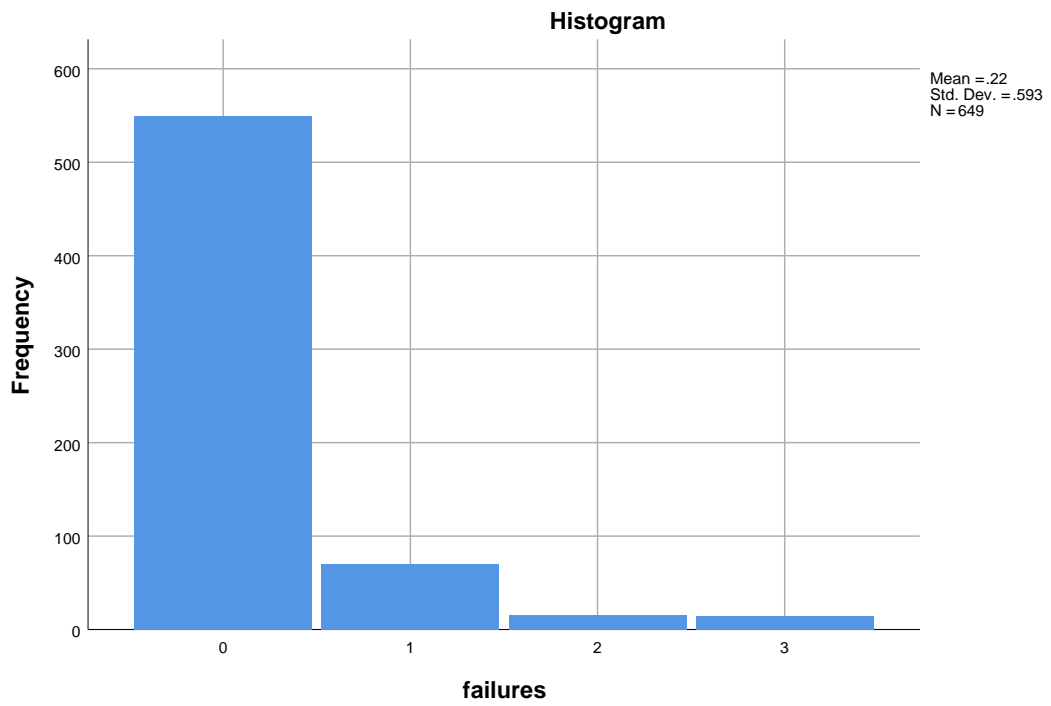
Before square root transformation



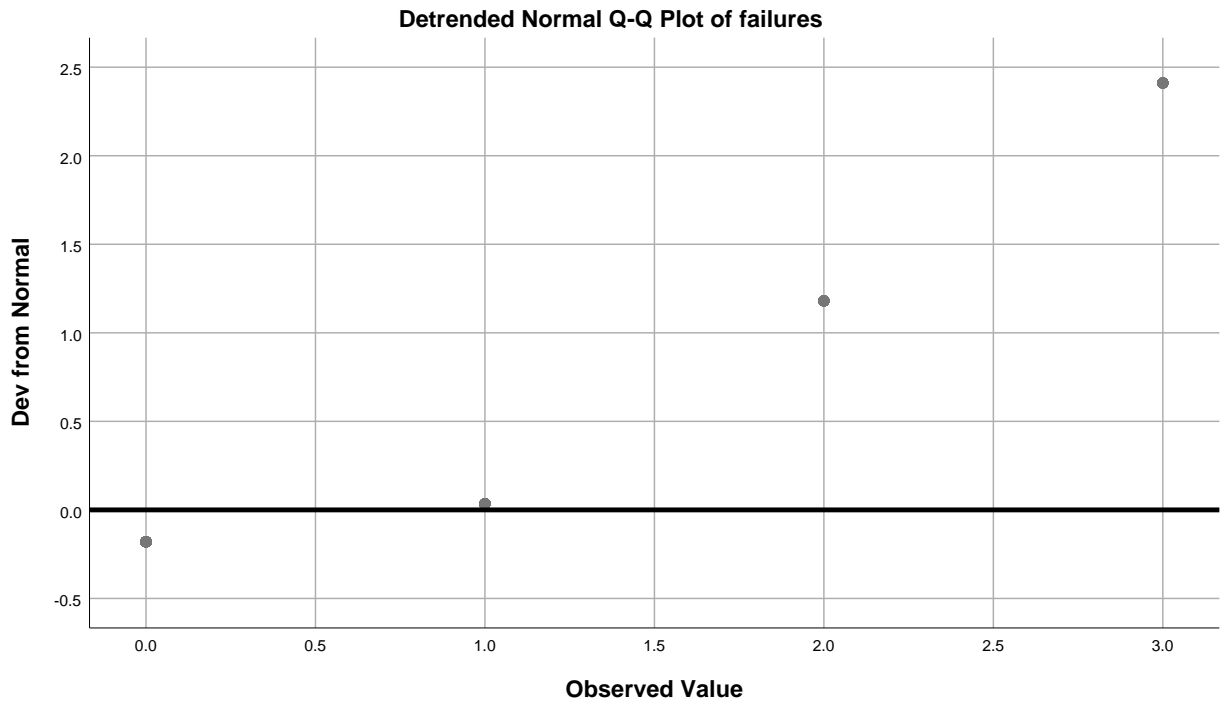
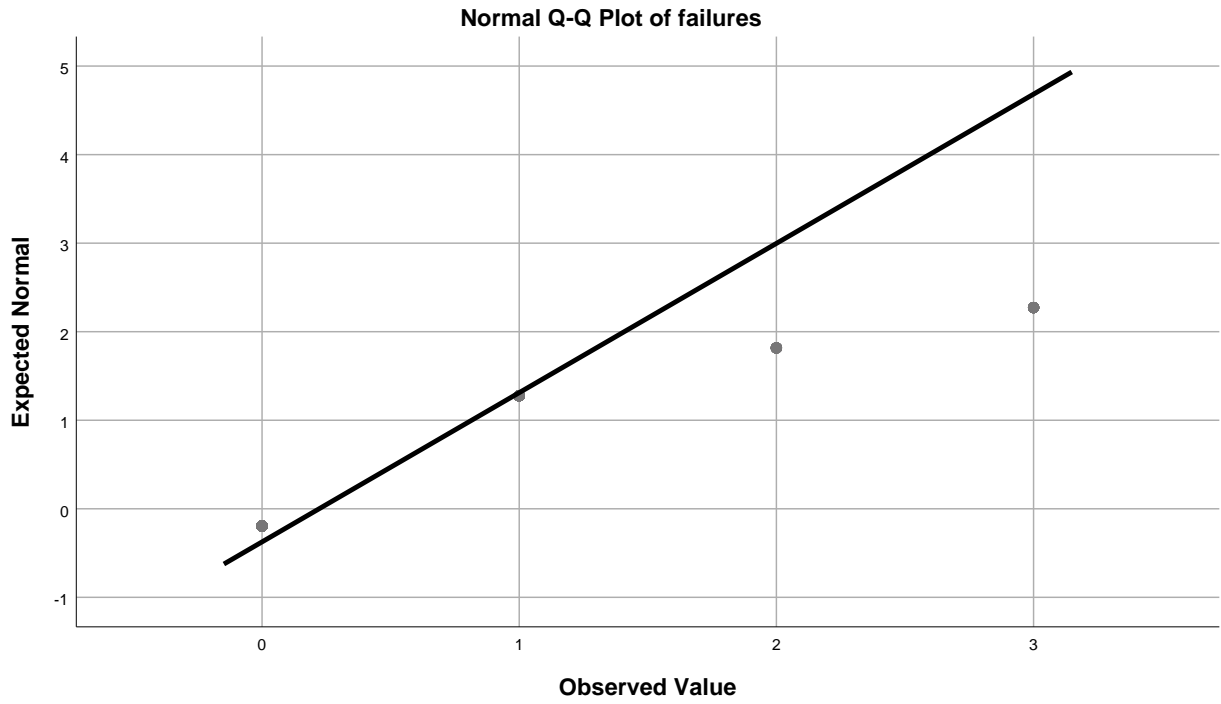
Before square root transformation



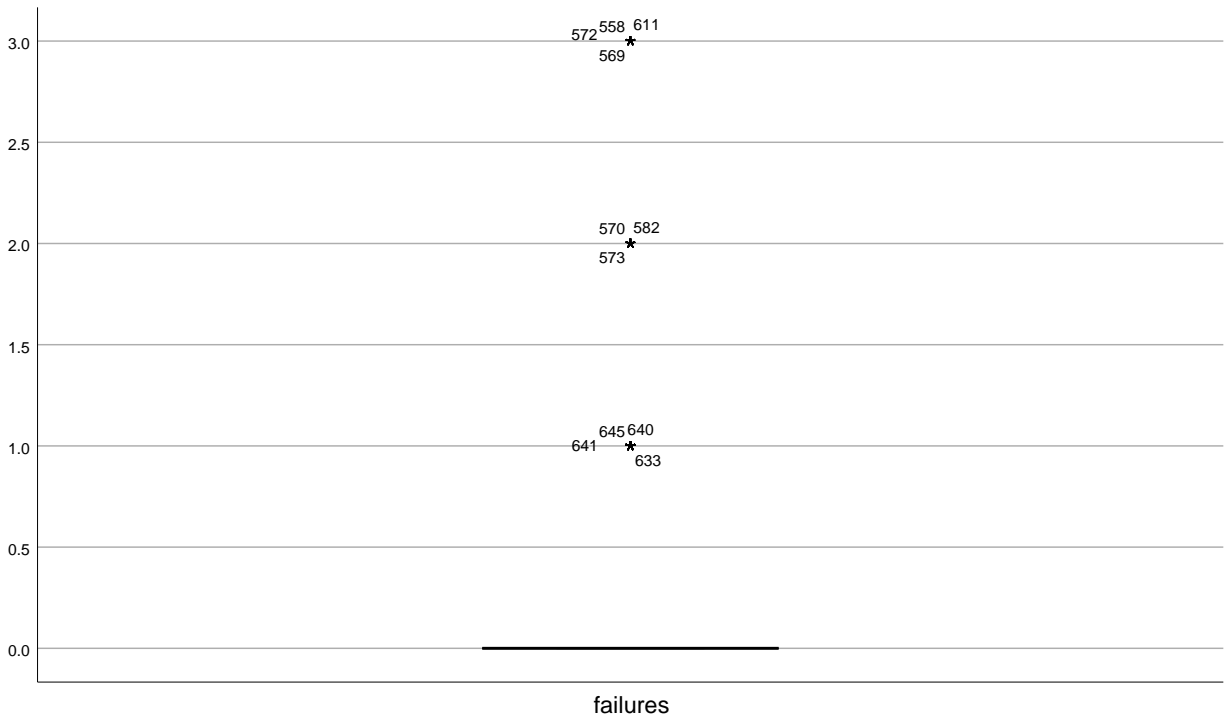
## failures



Before square root transformation



Before square root transformation



After square root transformation

## Explore

### Case Processing Summary

	Valid		Cases Missing		Total	
	N	Percent	N	Percent	N	Percent
	sqrt_absences	649	100.0%	0	0.0%	649
sqrt_G3	649	100.0%	0	0.0%	649	100.0%
sqrt_G2	649	100.0%	0	0.0%	649	100.0%
sqrt_G1	649	100.0%	0	0.0%	649	100.0%
sqrt_age	649	100.0%	0	0.0%	649	100.0%
sqrt_failures	649	100.0%	0	0.0%	649	100.0%

### Descriptives

		Statistic	Std. Error	
sqrt_absences	Mean	1.4152971	.05055877	
	95% Confidence Interval for Mean	Lower Bound	1.3160183	
		Upper Bound	1.5145758	
	5% Trimmed Mean	1.3410001		
	Median	1.4142136		
	Variance	1.659		
	Std. Deviation	1.28800875		
	Minimum	.00000		
	Maximum	5.65685		
	Range	5.65685		
	Interquartile Range	2.44949		
	Skewness	.391	.096	
	Kurtosis	-.711	.192	
sqrt_G3	Mean	3.3886063	.02556028	
	95% Confidence Interval for Mean	Lower Bound	3.3384153	
		Upper Bound	3.4387973	
	5% Trimmed Mean	3.4568985		
	Median	3.4641016		
	Variance	.424		
	Std. Deviation	.65116033		

After square root transformation

### Descriptives

		Statistic	Std. Error	
	Minimum	.00000		
	Maximum	4.35890		
	Range	4.35890		
	Interquartile Range	.57938		
	Skewness	-3.222	.096	
	Kurtosis	14.738	.192	
sqrt_G2	Mean	3.3608672	.02058854	
	95% Confidence Interval for Mean	Lower Bound	3.3204389	
		Upper Bound	3.4012955	
	5% Trimmed Mean	3.3911441		
	Median	3.3166248		
	Variance	.275		
	Std. Deviation	.52450289		
	Minimum	.00000		
	Maximum	4.35890		
	Range	4.35890		
	Interquartile Range	.44327		
	Skewness	-2.745	.096	
Kurtosis	16.248	.192		
sqrt_G1	Mean	3.3489274	.01683987	
	95% Confidence Interval for Mean	Lower Bound	3.3158601	
		Upper Bound	3.3819947	
	5% Trimmed Mean	3.3581993		
	Median	3.3166248		
	Variance	.184		
	Std. Deviation	.42900366		
	Minimum	.00000		
	Maximum	4.35890		
	Range	4.35890		
	Interquartile Range	.44327		
	Skewness	-.911	.096	
Kurtosis	5.174	.192		
sqrt_age	Mean	4.0892957	.00581118	

After square root transformation

### Descriptives

		Statistic	Std. Error
	95% Confidence Interval for Mean	Lower Bound	4.0778846
		Upper Bound	4.1007067
	5% Trimmed Mean	4.0838384	
	Median	4.1231056	
	Variance	.022	
	Std. Deviation	.14804259	
	Minimum	3.87298	
	Maximum	4.69042	
	Range	.81743	
	Interquartile Range	.24264	
	Skewness	.321	.096
	Kurtosis	-.157	.192
sqrt_failures	Mean	.1800865	.01709851
	95% Confidence Interval for Mean	Lower Bound	.1465113
		Upper Bound	.2136617
	5% Trimmed Mean	.1156480	
	Median	.0000000	
	Variance	.190	
	Std. Deviation	.43559274	
	Minimum	.00000	
	Maximum	1.73205	
	Range	1.73205	
	Interquartile Range	.00000	
	Skewness	2.206	.096
Kurtosis	3.499	.192	

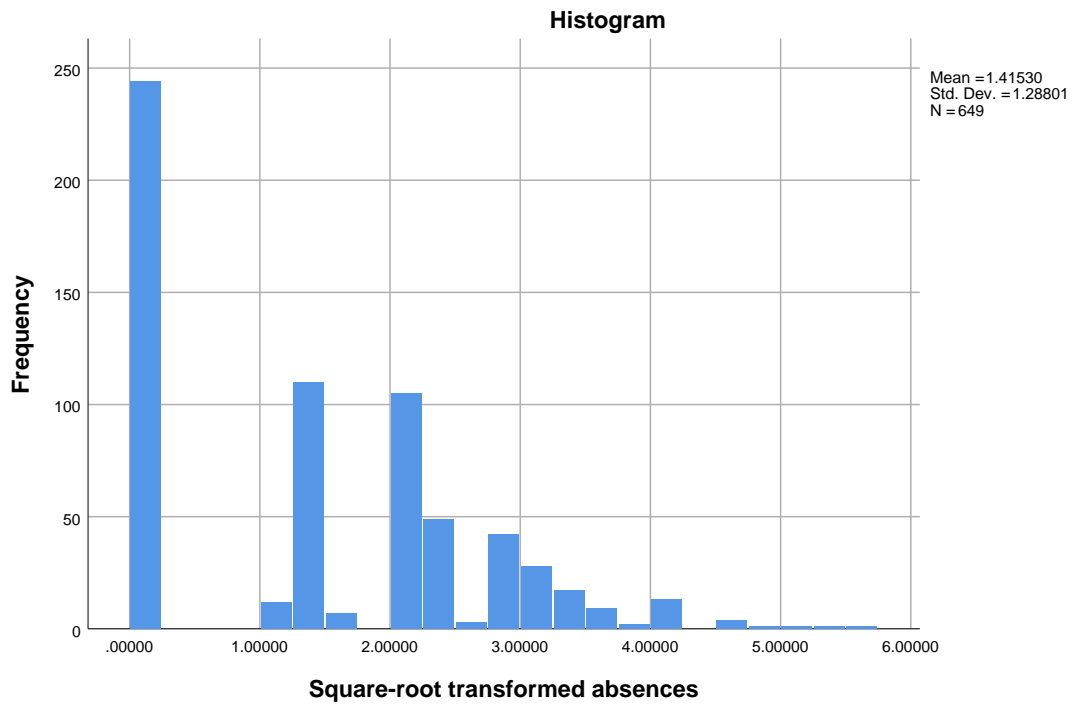
After square root transformation

### Tests of Normality

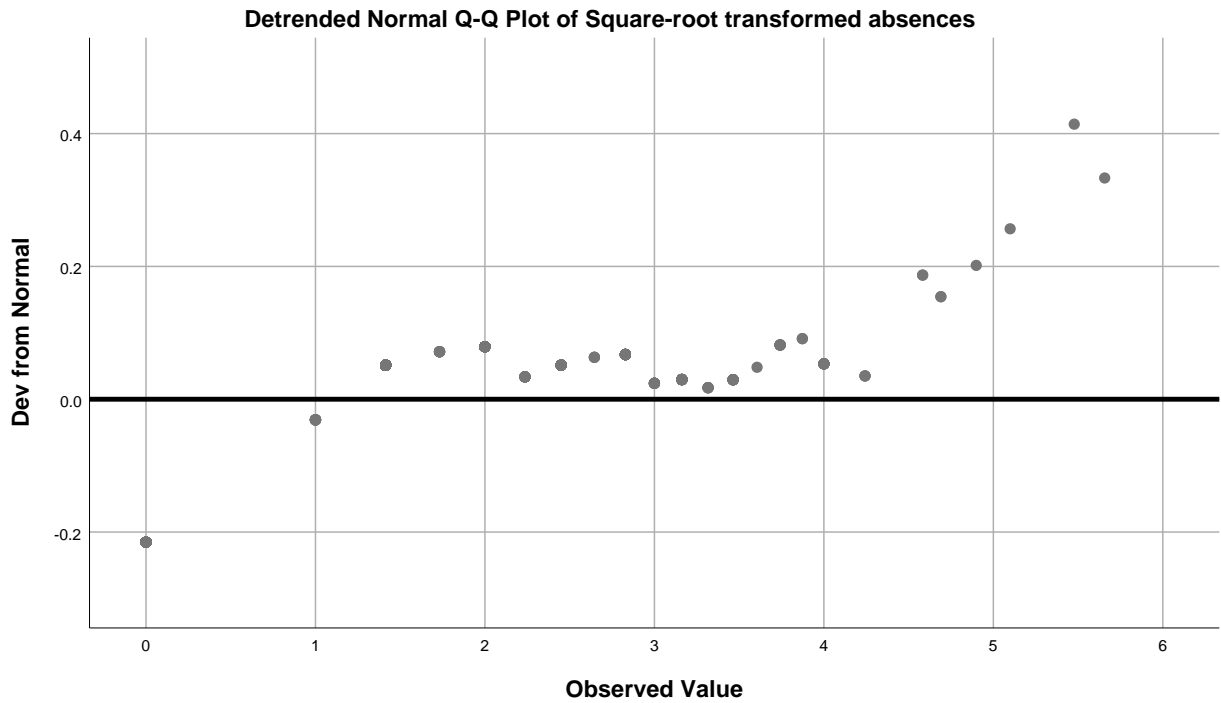
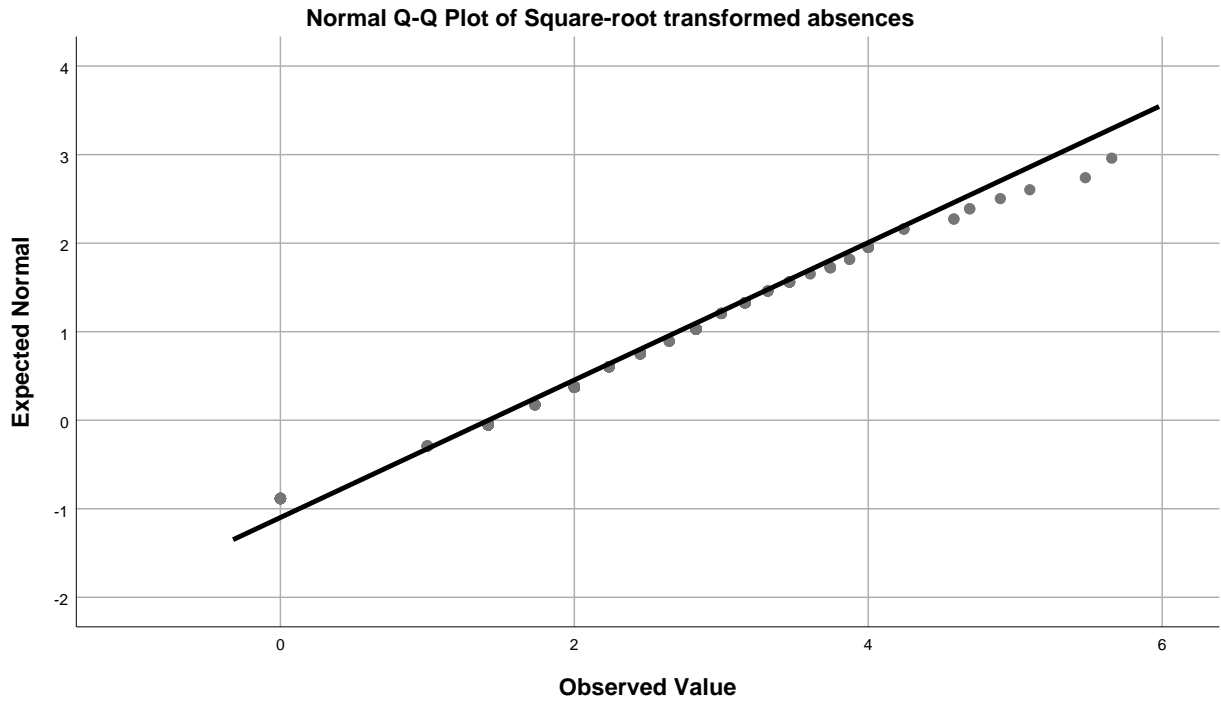
	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
sqrt_absences	.240	649	.000	.880	649	.000
sqrt_G3	.210	649	.000	.696	649	.000
sqrt_G2	.133	649	.000	.795	649	.000
sqrt_G1	.090	649	.000	.951	649	.000
sqrt_age	.172	649	.000	.918	649	.000
sqrt_failures	.506	649	.000	.456	649	.000

a. Lilliefors Significance Correction

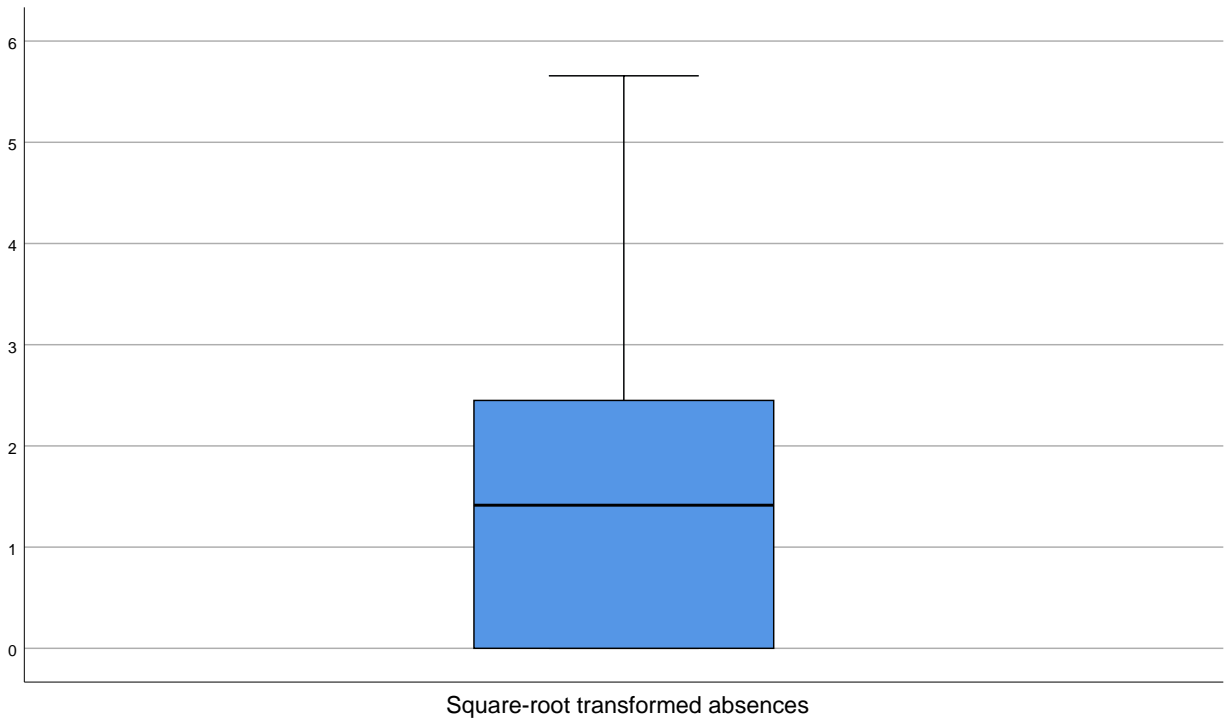
### Square-root transformed absences



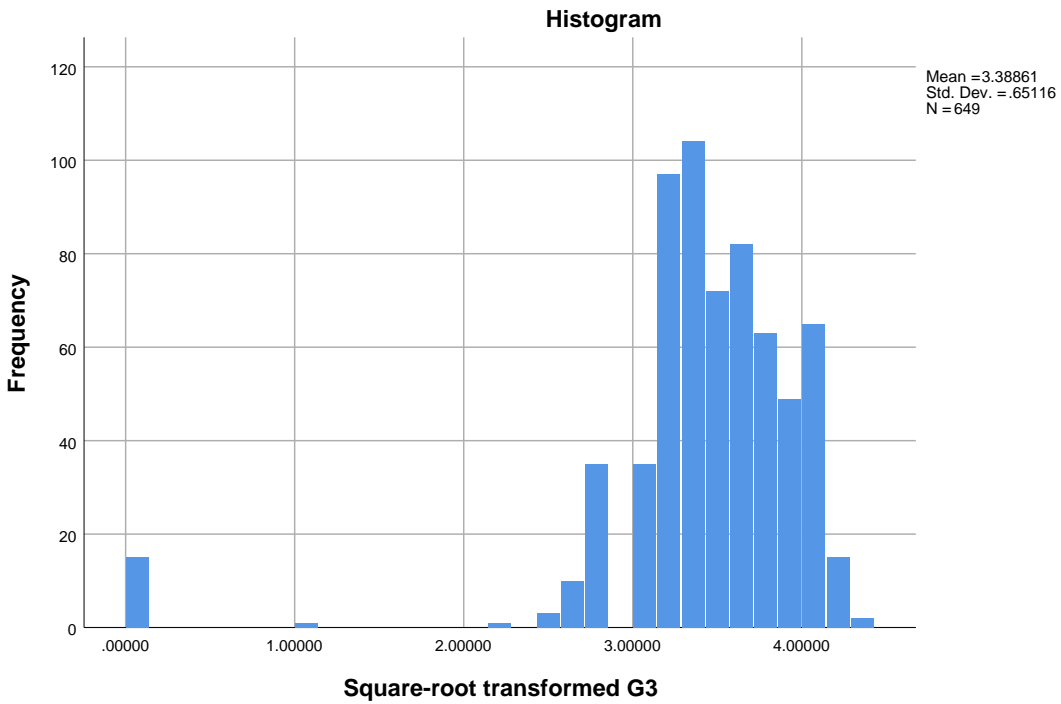
After square root transformation



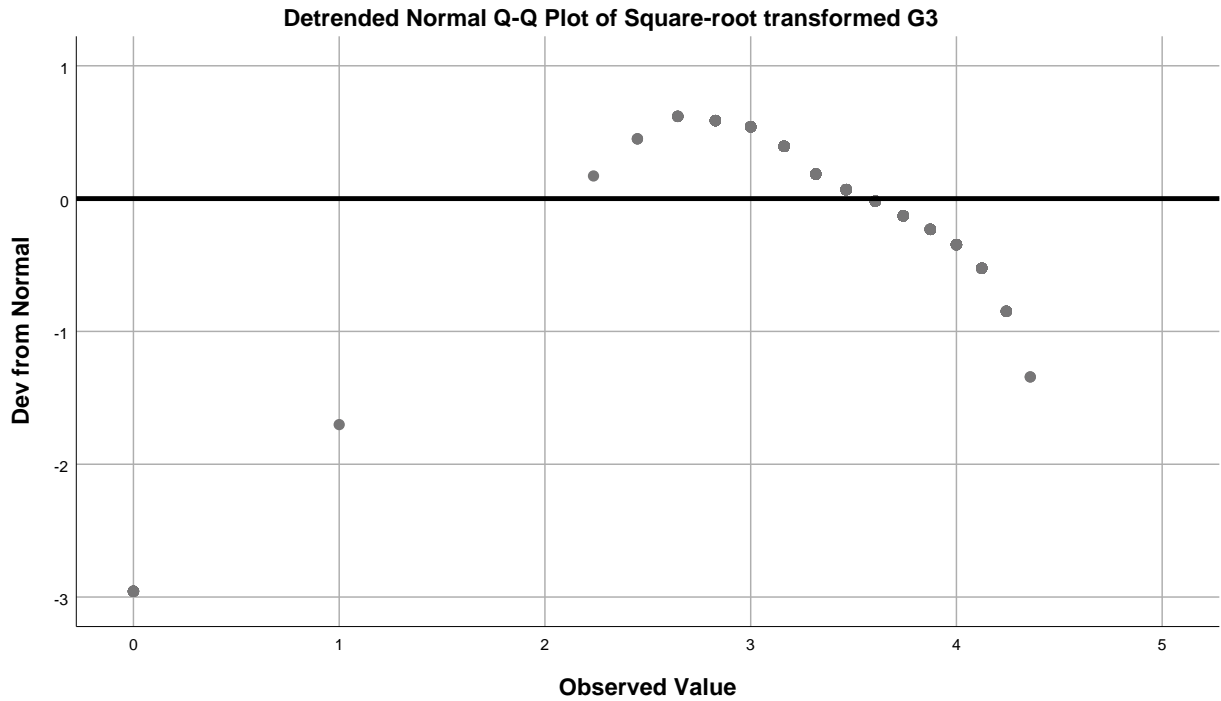
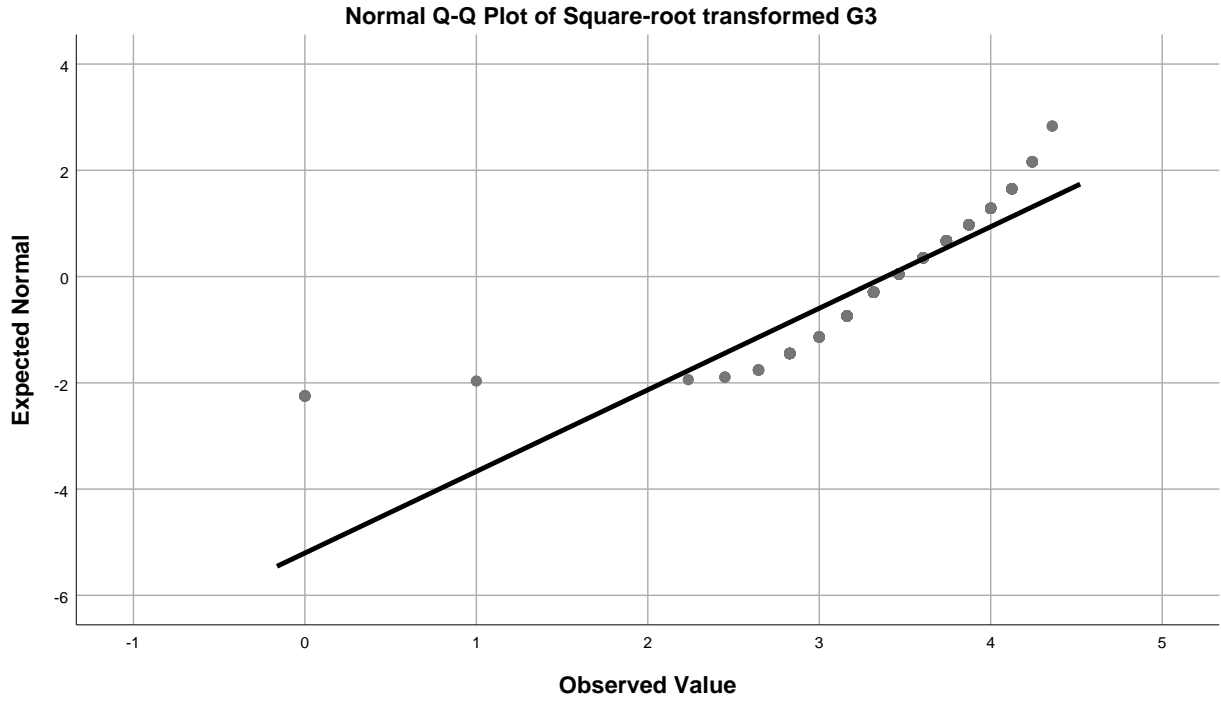
After square root transformation



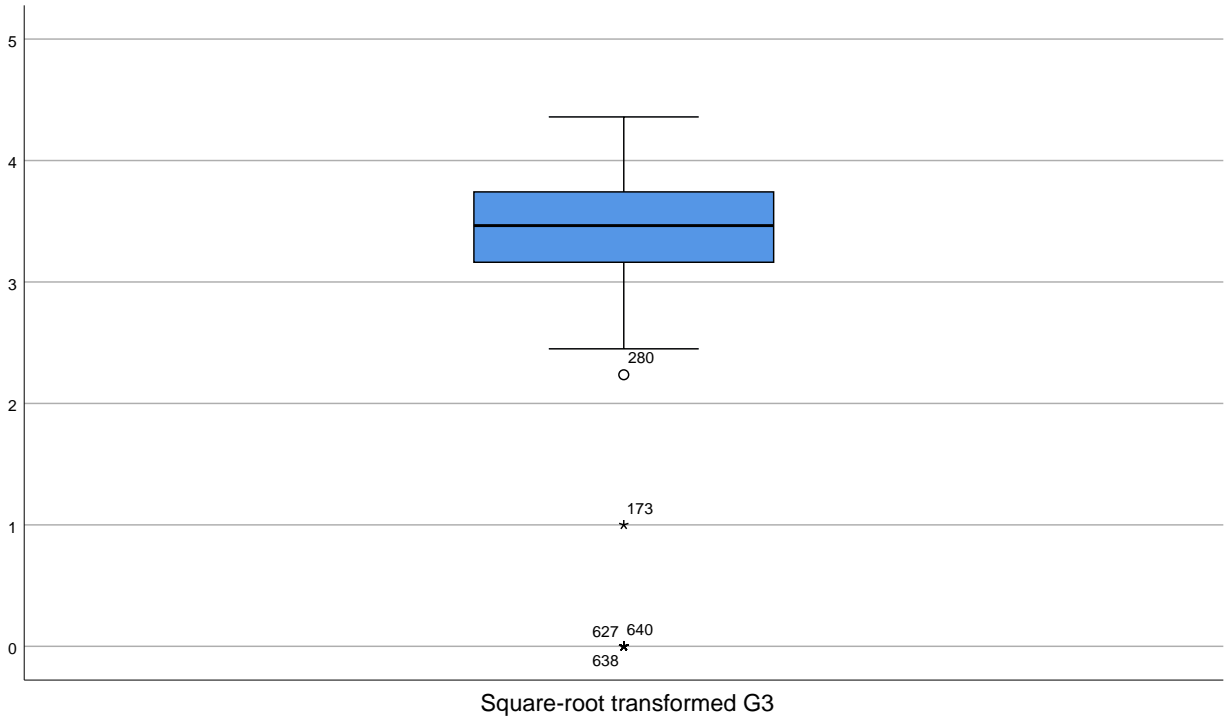
### Square-root transformed G3



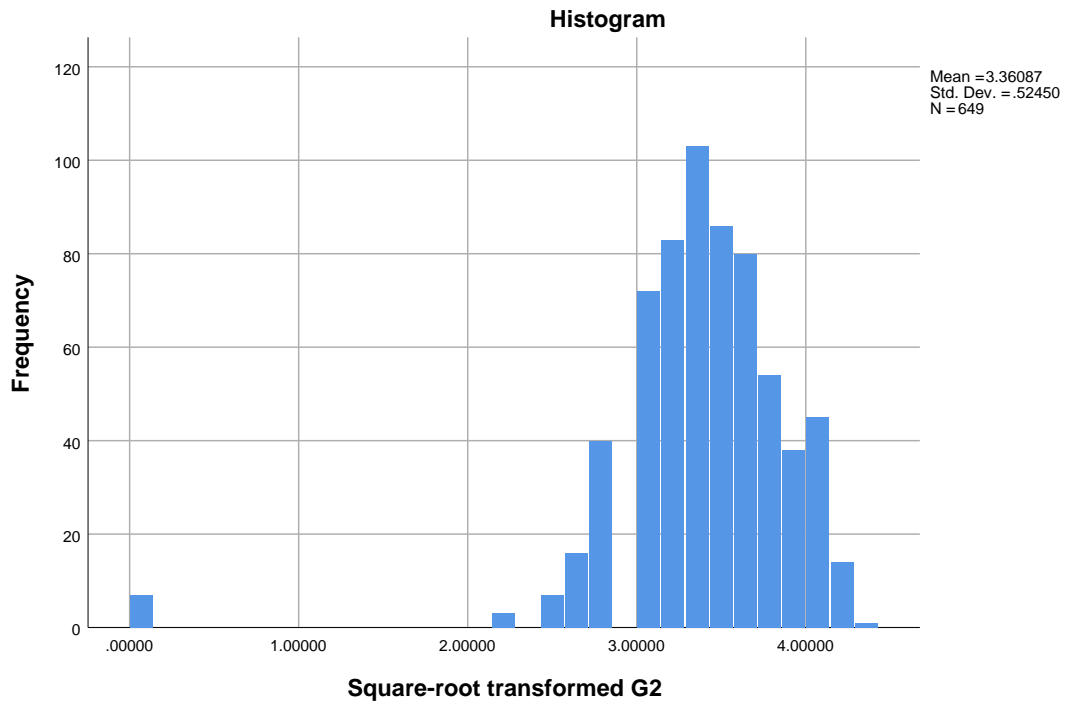
After square root transformation



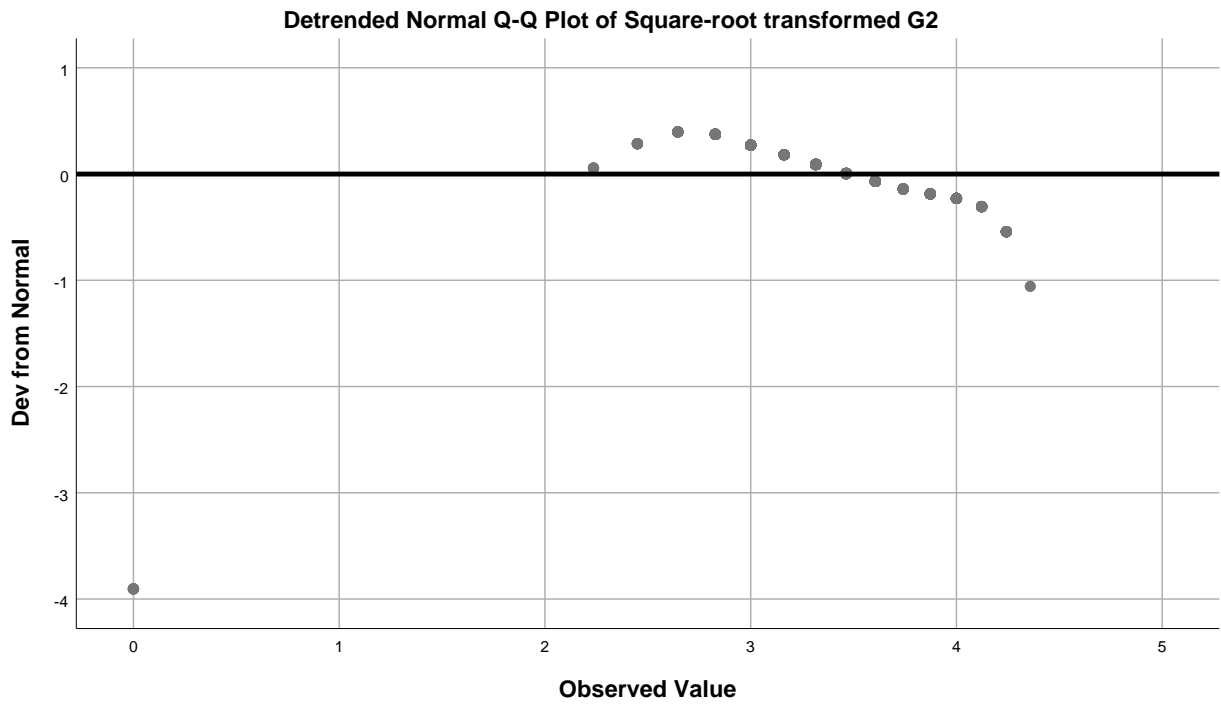
After square root transformation



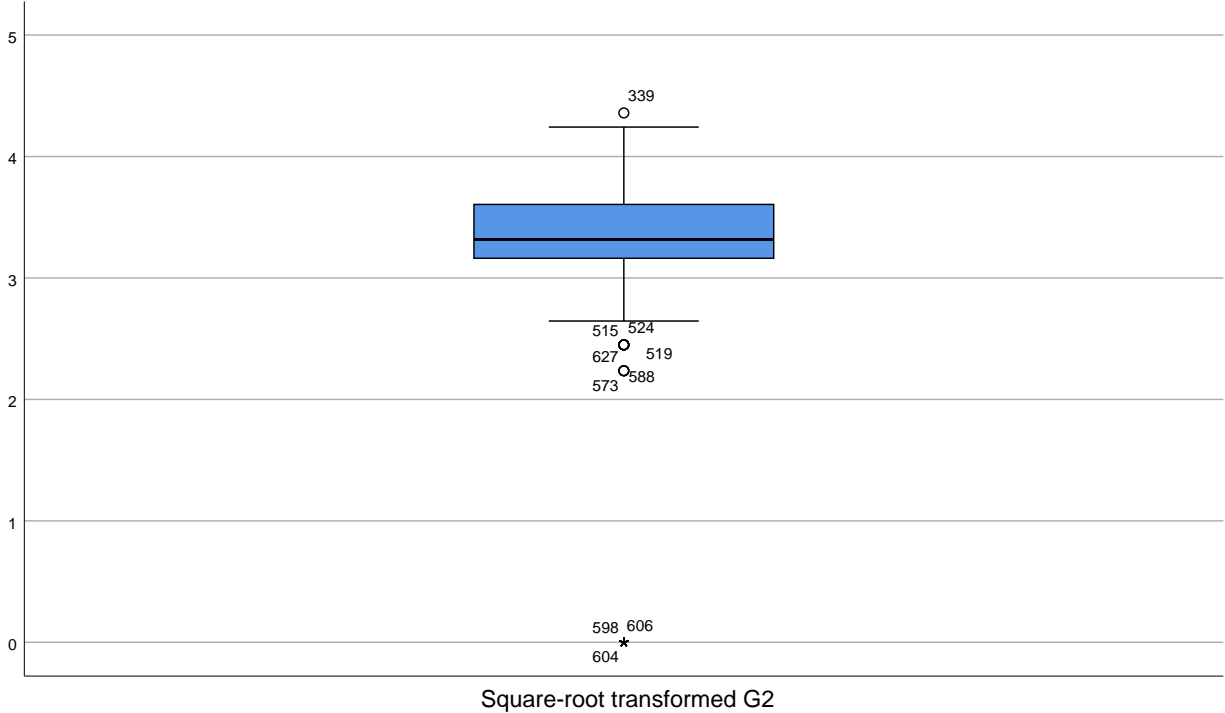
Square-root transformed G2



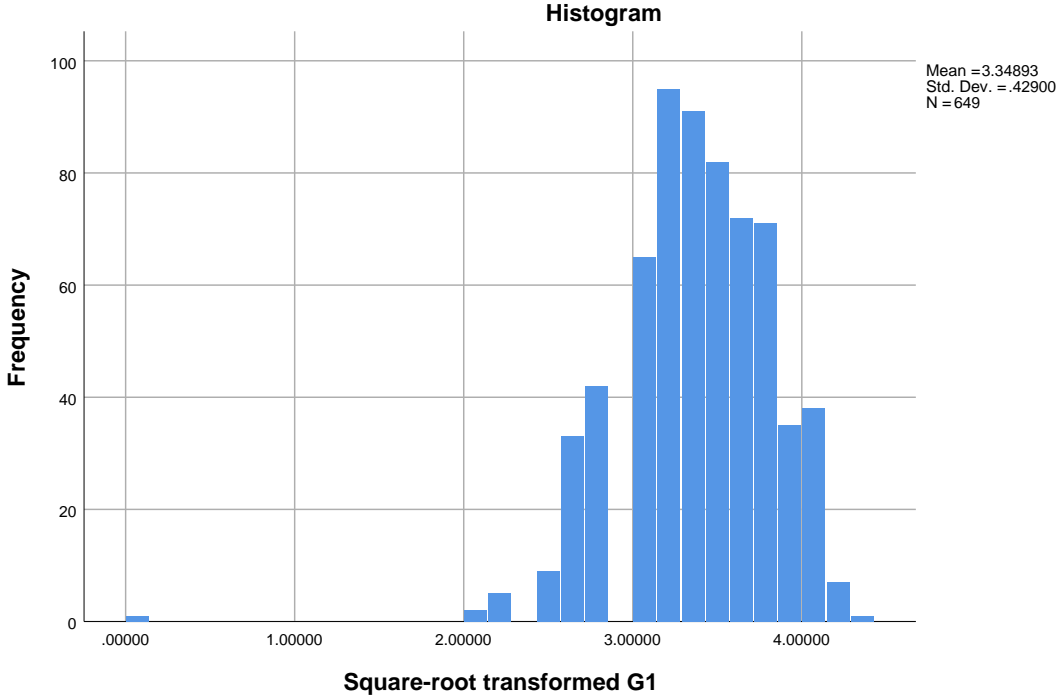
After square root transformation



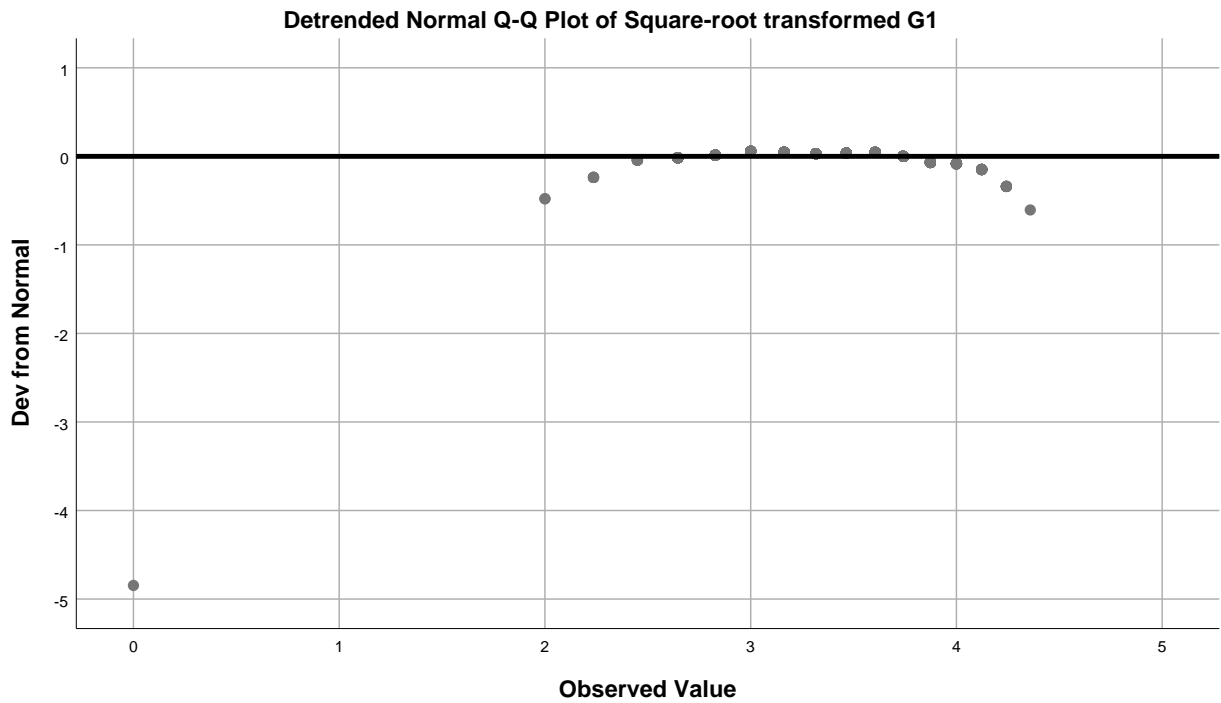
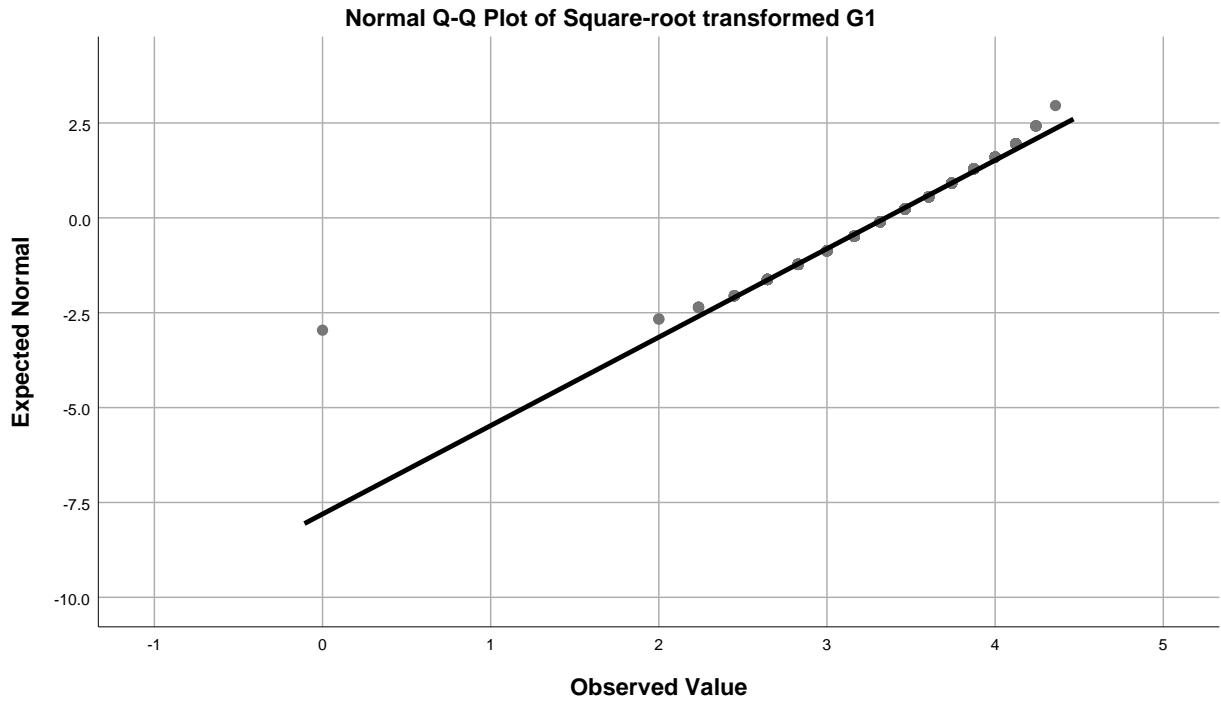
After square root transformation



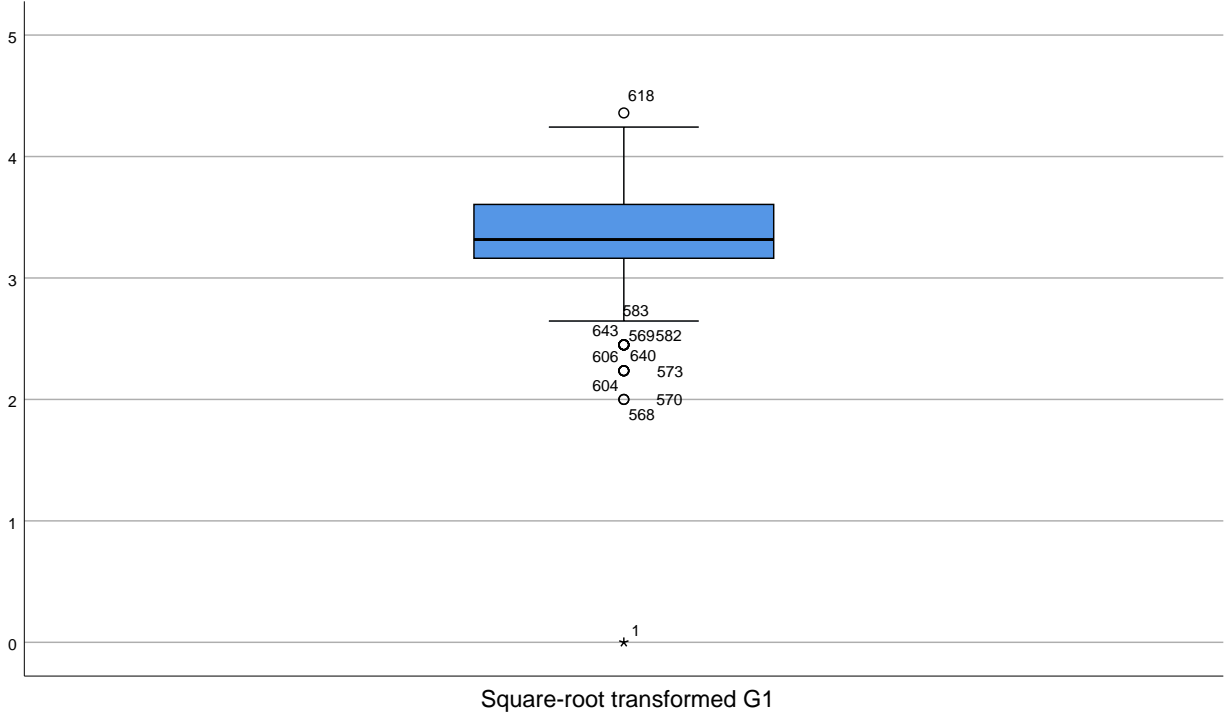
Square-root transformed G1



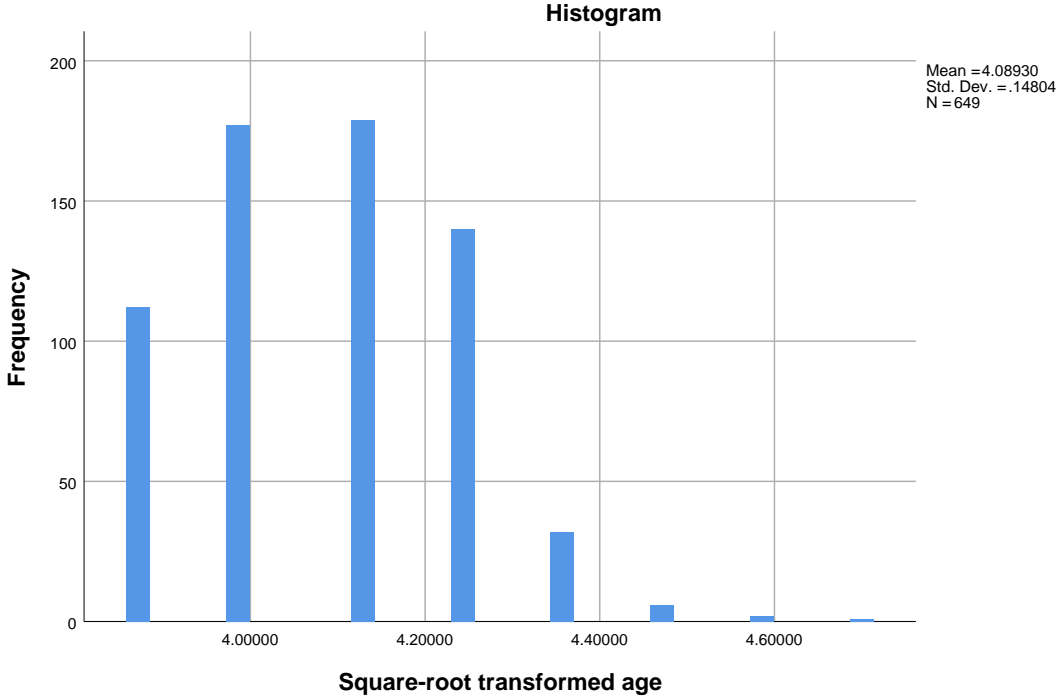
After square root transformation



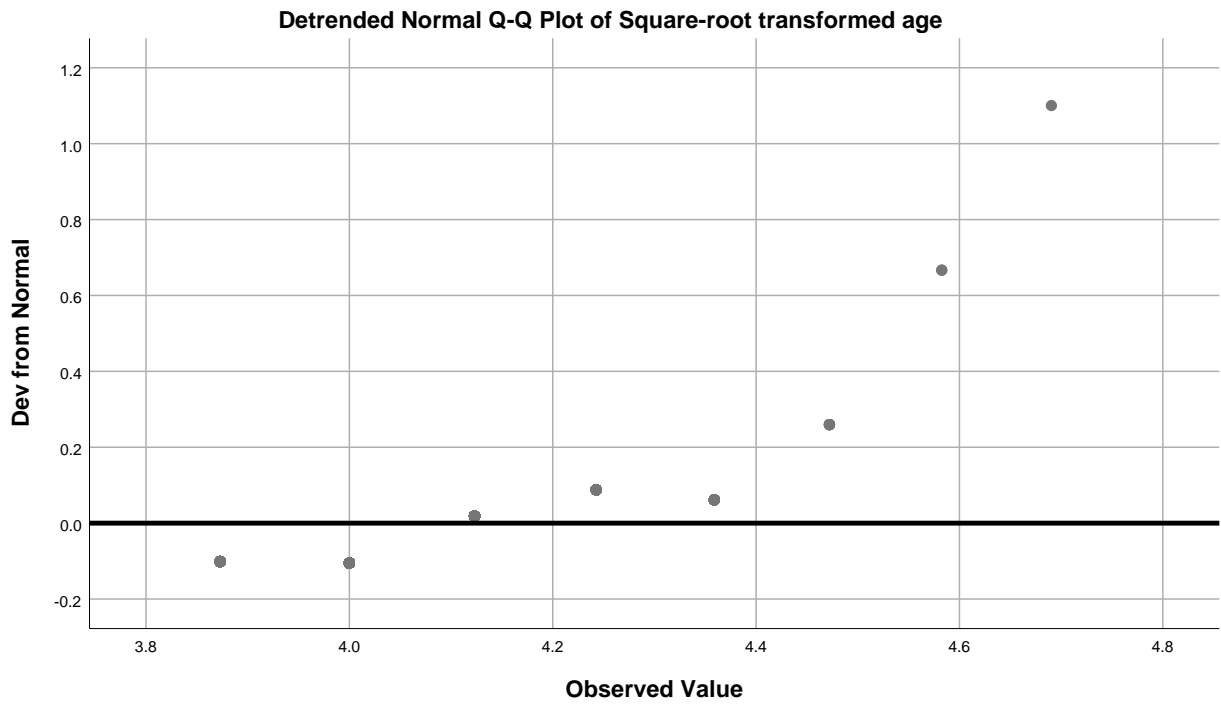
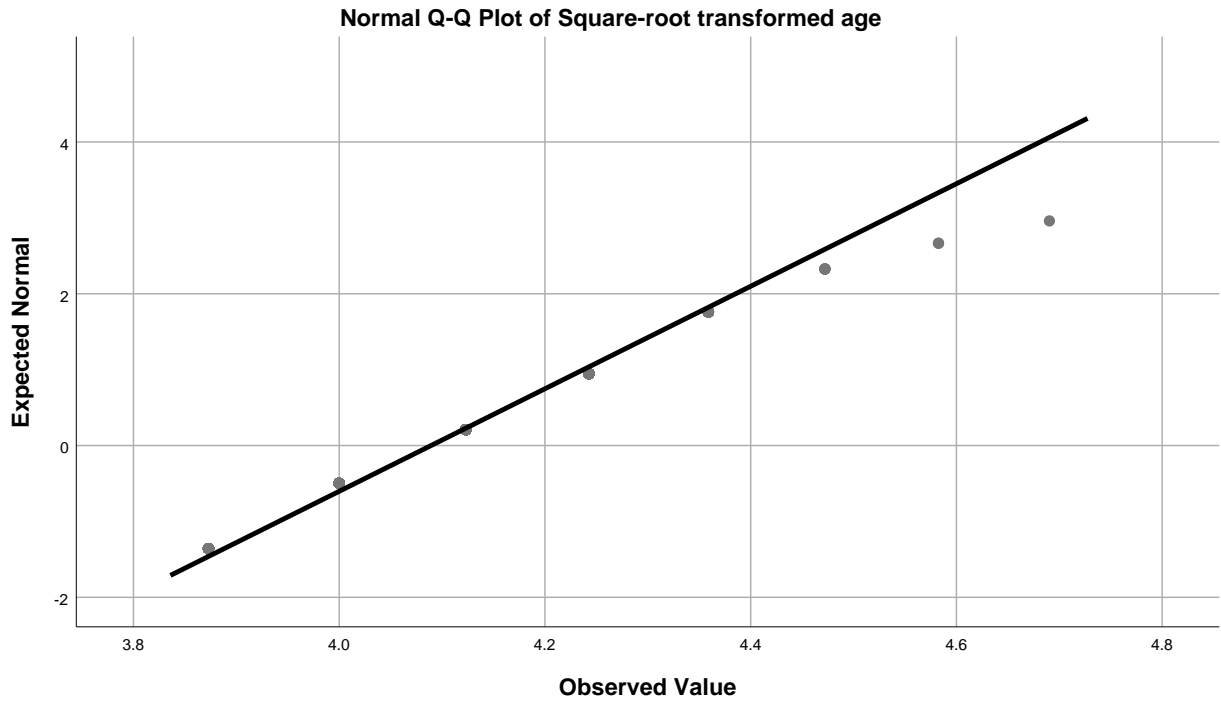
After square root transformation



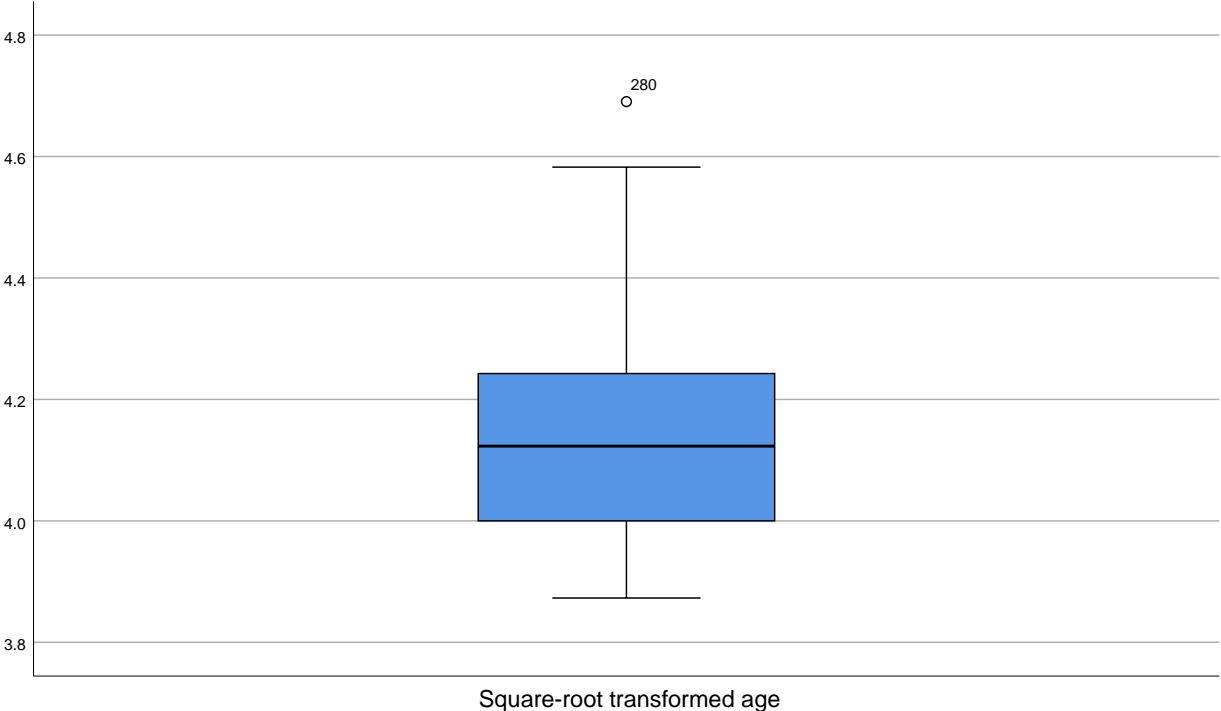
Square-root transformed age



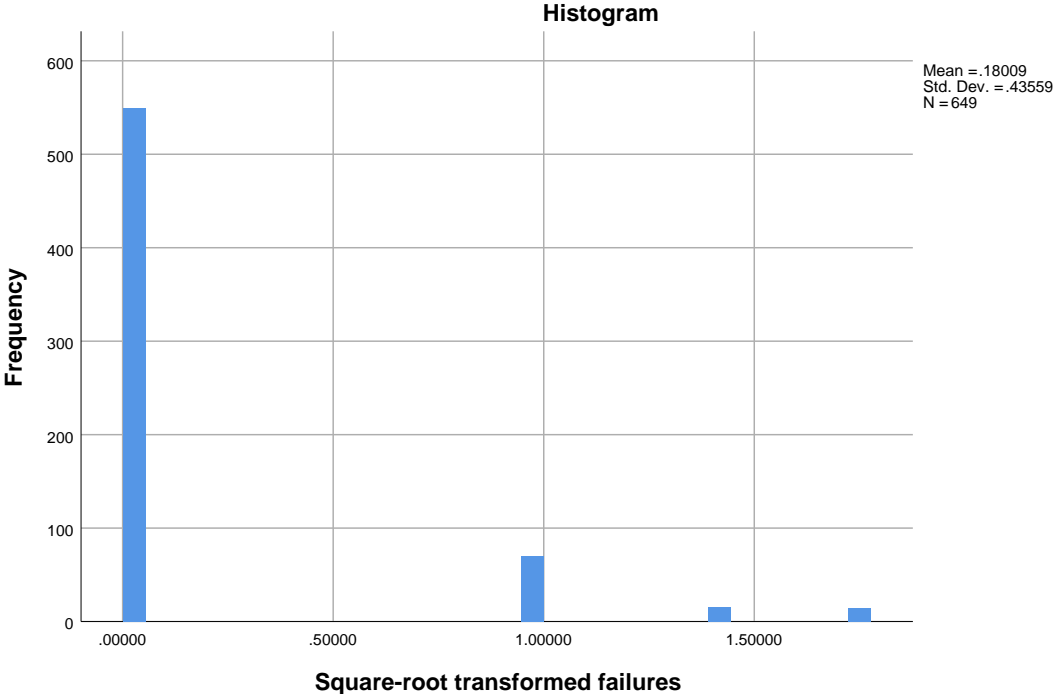
After square root transformation



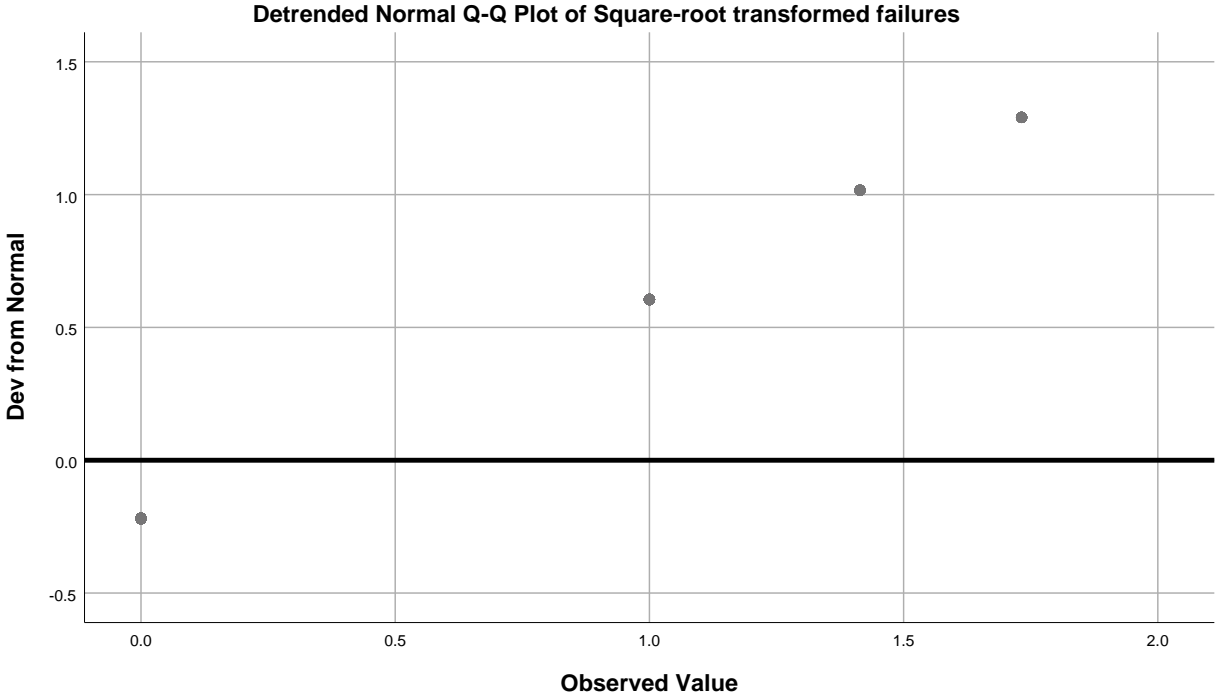
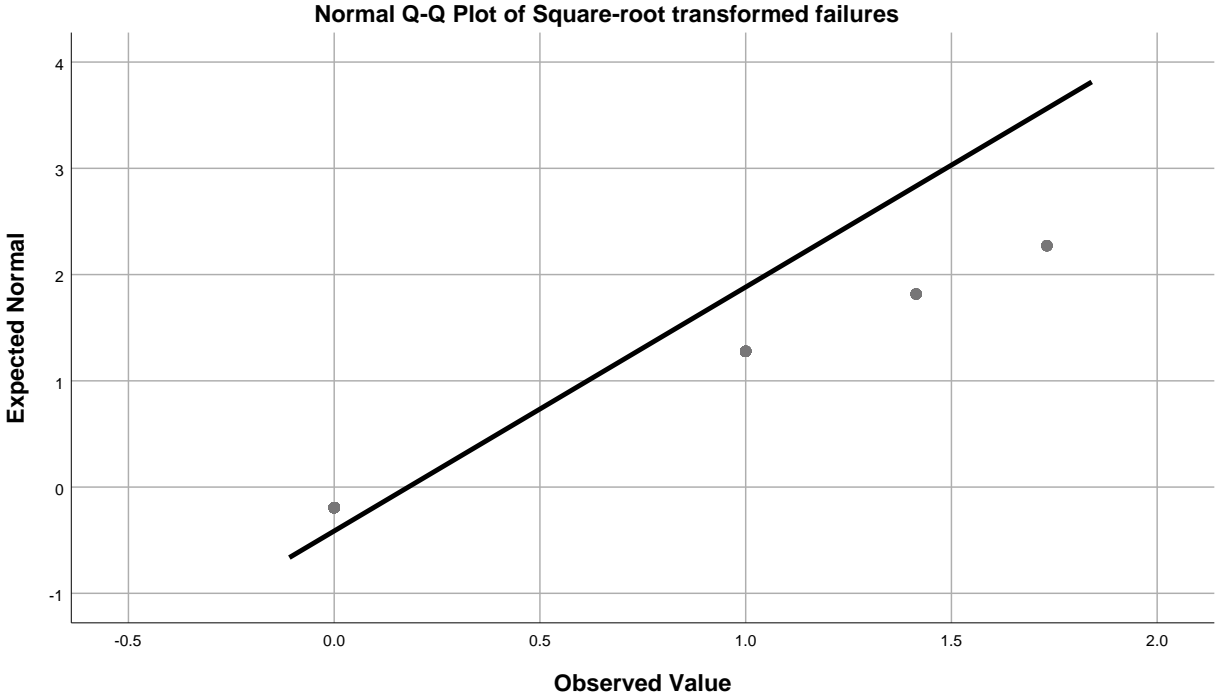
After square root transformation



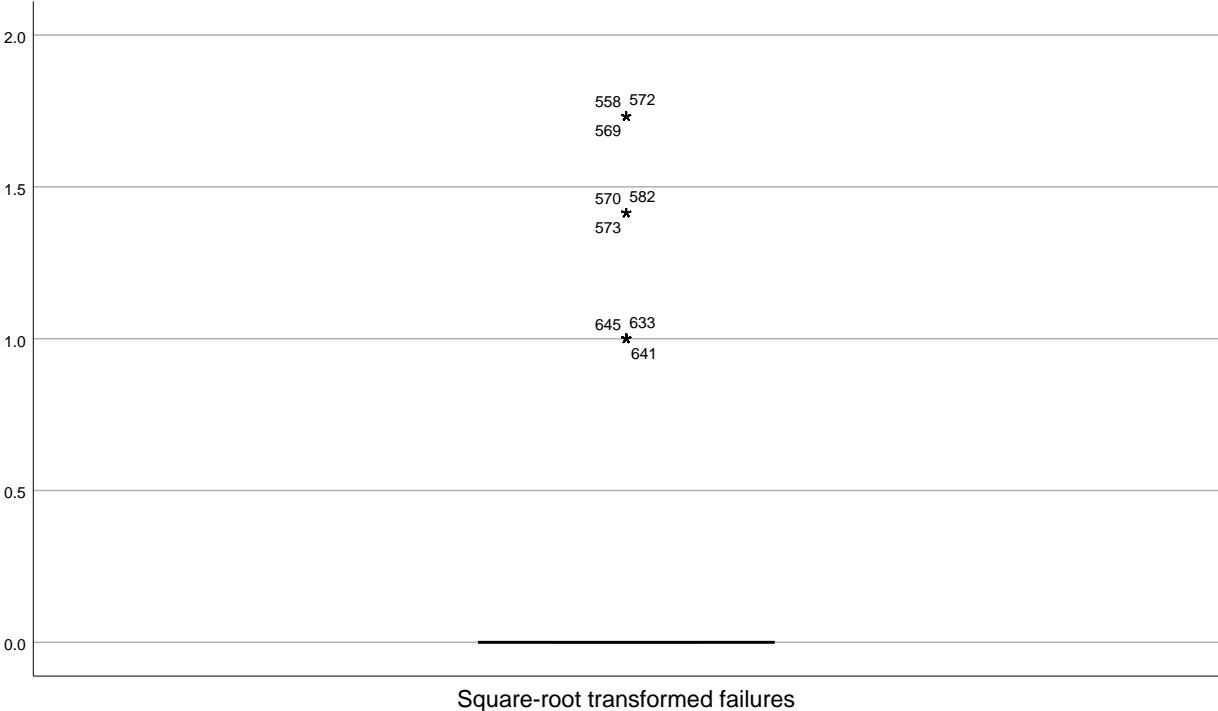
Square-root transformed failures



After square root transformation



After square root transformation



Before and after square-root transformation descriptives

## Descriptives

### Descriptive Statistics

	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic
absences	649	0	32	3.66	4.641	2.021
sqrt_absences	649	.00000	5.65685	1.4152971	1.28800875	.391
G3	649	0	19	11.91	3.231	-.913
sqrt_G3	649	.00000	4.35890	3.3886063	.65116033	-3.222
G2	649	0	19	11.57	2.914	-.360
sqrt_G2	649	.00000	4.35890	3.3608672	.52450289	-2.745
G1	649	0	19	11.40	2.745	-.003
sqrt_G1	649	.00000	4.35890	3.3489274	.42900366	-.911
age	649	15	22	16.74	1.218	.417
sqrt_age	649	3.87298	4.69042	4.0892957	.14804259	.321
failures	649	0	3	.22	.593	3.093
sqrt_failures	649	.00000	1.73205	.1800865	.43559274	2.206
Valid N (listwise)	649					

### Descriptive Statistics

	Skewness	Kurtosis	
	Std. Error	Statistic	Std. Error
absences	.096	5.781	.192
sqrt_absences	.096	-.711	.192
G3	.096	2.712	.192
sqrt_G3	.096	14.738	.192
G2	.096	1.662	.192
sqrt_G2	.096	16.248	.192
G1	.096	.037	.192
sqrt_G1	.096	5.174	.192
age	.096	.072	.192
sqrt_age	.096	-.157	.192
failures	.096	9.824	.192
sqrt_failures	.096	3.499	.192
Valid N (listwise)			

Square root transformation shift values

**List**

Square root transformation shift values

shift_absences	shift_G3	shift_G2	shift_G1	shift_age	shift_failures
.00000	.00000	.00000	.00000	.00000	.00000

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

Group context after square root transformation

**Means**

**Case Processing Summary**

	Included		Cases Excluded		Total	
	N	Percent	N	Percent	N	Percent
	absences * sex	649	100.0%	0	0.0%	649
sqrt_absences * sex	649	100.0%	0	0.0%	649	100.0%

**Report**

sex		absences	sqrt_absences
F	N	383	383
	Mean	3.58	1.3971349
	Std. Deviation	4.668	1.27643706
	Variance	21.789	1.629
M	N	266	266
	Mean	3.78	1.4414478
	Std. Deviation	4.608	1.30646102
	Variance	21.230	1.707
Total	N	649	649
	Mean	3.66	1.4152971
	Std. Deviation	4.641	1.28800875
	Variance	21.537	1.659