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Binary Logistic Regression

Binary Logistic Regression
Import data

Binary Logistic Regression Variable Preparation

Binary Logistic Regression Variable Preparation

Create binary target, dummy predictors, and labels

Binary Logistic Prepared Data Summary

Binary Logistic Prepared Data Summary
Outcome balance and predictor context

Frequencies

[BinaryLogisticData] D:\DATA ANALYSIS\H Regression Tests and Models\Binary Logistic Regression\SPSS_Output\sav\Binary-Logistic-Regression-data.sav

Statistics

		Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	School dummy: 1 = MS, 0 = GP	Sex dummy: 1 = male, 0 = female	Address dummy: 1 = urban, 0 = rural	Higher education intention dummy: yes
N	Valid	649	649	649	649	649
	Missing	0	0	0	0	0

Statistics

		Internet access dummy: yes	School educational support dummy: yes	Family educational support dummy: yes	Extra paid classes dummy: yes	Extra-curricular activities dummy: yes
N	Valid	649	649	649	649	649
	Missing	0	0	0	0	0

Frequency Table

Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not pass: G3 < 10	100	15.4	15.4	15.4
	Pass: G3 >= 10	549	84.6	84.6	100.0
	Total	649	100.0	100.0	

School dummy: 1 = MS, 0 = GP

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No / reference	423	65.2	65.2	65.2
	Yes / target	226	34.8	34.8	100.0
	Total	649	100.0	100.0	

Binary Logistic Prepared Data Summary
Outcome balance and predictor context

Sex dummy: 1 = male, 0 = female

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No / reference	383	59.0	59.0	59.0
	Yes / target	266	41.0	41.0	100.0
	Total	649	100.0	100.0	

Address dummy: 1 = urban, 0 = rural

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No / reference	197	30.4	30.4	30.4
	Yes / target	452	69.6	69.6	100.0
	Total	649	100.0	100.0	

Higher education intention dummy: yes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No / reference	69	10.6	10.6	10.6
	Yes / target	580	89.4	89.4	100.0
	Total	649	100.0	100.0	

Internet access dummy: yes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No / reference	151	23.3	23.3	23.3
	Yes / target	498	76.7	76.7	100.0
	Total	649	100.0	100.0	

School educational support dummy: yes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No / reference	581	89.5	89.5	89.5
	Yes / target	68	10.5	10.5	100.0
	Total	649	100.0	100.0	

Binary Logistic Prepared Data Summary
Outcome balance and predictor context

Family educational support dummy: yes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No / reference	251	38.7	38.7	38.7
	Yes / target	398	61.3	61.3	100.0
	Total	649	100.0	100.0	

Extra paid classes dummy: yes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No / reference	610	94.0	94.0	94.0
	Yes / target	39	6.0	6.0	100.0
	Total	649	100.0	100.0	

Extra-curricular activities dummy: yes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No / reference	334	51.5	51.5	51.5
	Yes / target	315	48.5	48.5	100.0
	Total	649	100.0	100.0	

Descriptives

Binary Logistic Prepared Data Summary
Outcome balance and predictor context

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
First period grade	649	0	19	11.40	2.745
Second period grade	649	0	19	11.57	2.914
Final grade	649	0	19	11.91	3.231
Weekly study time group	649	1	4	1.93	.830
Number of past class failures	649	0	3	.22	.593
Student age	649	15	22	16.74	1.218
Mother education	649	0	4	2.51	1.135
Father education	649	0	4	2.31	1.100
Home to school travel time	649	1	4	1.57	.749
Current health status	649	1	5	3.54	1.446
School absences	649	0	32	3.66	4.641
Valid N (listwise)	649				

Crosstabs

Binary Logistic Prepared Data Summary
Outcome balance and predictor context

Case Processing Summary

	Valid		Cases Missing		Total	
	N	Percent	N	Percent	N	Percent
Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass * School dummy: 1 = MS, 0 = GP	649	100.0%	0	0.0%	649	100.0%
Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass * Sex dummy: 1 = male, 0 = female	649	100.0%	0	0.0%	649	100.0%
Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass * Address dummy: 1 = urban, 0 = rural	649	100.0%	0	0.0%	649	100.0%
Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass * Higher education intention dummy: yes	649	100.0%	0	0.0%	649	100.0%
Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass * Internet access dummy: yes	649	100.0%	0	0.0%	649	100.0%
Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass * Number of past class failures	649	100.0%	0	0.0%	649	100.0%

Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass * School dummy: 1 = MS, 0 = GP

Binary Logistic Prepared Data Summary
Outcome balance and predictor context

Crosstab

			School dummy: .
			No / reference
Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	Not pass: G3 < 10	Count	32
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	32.0%
		% within School dummy: 1 = MS, 0 = GP	7.6%
	Pass: G3 >= 10	Count	391
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	71.2%
		% within School dummy: 1 = MS, 0 = GP	92.4%
Total	Count		423
	% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass		65.2%
	% within School dummy: 1 = MS, 0 = GP		100.0%

Binary Logistic Prepared Data Summary
Outcome balance and predictor context

Crosstab

			School dummy: ...	
			Yes / target	Total
Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	Not pass: G3 < 10	Count	68	100
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	68.0%	100.0%
		% within School dummy: 1 = MS, 0 = GP	30.1%	15.4%
	Pass: G3 >= 10	Count	158	549
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	28.8%	100.0%
		% within School dummy: 1 = MS, 0 = GP	69.9%	84.6%
Total			Count	226
			% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	34.8%
			% within School dummy: 1 = MS, 0 = GP	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	57.331 ^a	1	.000		
Continuity Correction ^b	55.616	1	.000		
Likelihood Ratio	54.596	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	57.243	1	.000		
N of Valid Cases	649				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 34.82.

b. Computed only for a 2x2 table

Binary Logistic Prepared Data Summary
Outcome balance and predictor context

Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass (Not pass: G3 < 10 / Pass: G3 >= 10)	.190	.120	.301
For cohort School dummy: 1 = MS, 0 = GP = No / reference	.449	.336	.601
For cohort School dummy: 1 = MS, 0 = GP = Yes / target	2.363	1.958	2.852
N of Valid Cases	649		

Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass * Sex dummy: 1 = male, 0 = female

Crosstab

			Sex dummy: 1 = male, 0 = ...
			No / reference
Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	Not pass: G3 < 10	Count	50
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	50.0%
		% within Sex dummy: 1 = male, 0 = female	13.1%

Binary Logistic Prepared Data Summary
Outcome balance and predictor context

Crosstab

			Sex dummy: 1 = male, 0 = female	
			Yes / target	Total
Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	Not pass: G3 < 10	Count	50	100
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	50.0%	100.0%
		% within Sex dummy: 1 = male, 0 = female	18.8%	15.4%

Crosstab

			Sex dummy: 1 = male, 0 = ...	
			No / reference	
Pass: G3 >= 10		Count	333	
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	60.7%	
		% within Sex dummy: 1 = male, 0 = female	86.9%	
Total		Count	383	
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	59.0%	
		% within Sex dummy: 1 = male, 0 = female	100.0%	

Binary Logistic Prepared Data Summary
Outcome balance and predictor context

Crosstab

		Sex dummy: 1 = male, 0 = female	
		Yes / target	Total
Pass: G3 >= 10	Count	216	549
	% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	39.3%	100.0%
	% within Sex dummy: 1 = male, 0 = female	81.2%	84.6%
Total	Count	266	649
	% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	41.0%	100.0%
	% within Sex dummy: 1 = male, 0 = female	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.971 ^a	1	.046		
Continuity Correction ^b	3.543	1	.060		
Likelihood Ratio	3.918	1	.048		
Fisher's Exact Test				.060	.030
Linear-by-Linear Association	3.965	1	.046		
N of Valid Cases	649				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 40.99.

b. Computed only for a 2x2 table

Binary Logistic Prepared Data Summary
Outcome balance and predictor context

Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass (Not pass: G3 < 10 / Pass: G3 >= 10)	.649	.423	.995
For cohort Sex dummy: 1 = male, 0 = female = No / reference	.824	.670	1.014
For cohort Sex dummy: 1 = male, 0 = female = Yes / target	1.271	1.018	1.586
N of Valid Cases	649		

Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass * Address dummy: 1 = urban, 0 = rural

Crosstab

			Address dummy: 1 = ... No / reference
Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	Not pass: G3 < 10	Count	44
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	44.0%
		% within Address dummy: 1 = urban, 0 = rural	22.3%

Binary Logistic Prepared Data Summary
Outcome balance and predictor context

Crosstab

			Address dummy: 1 = urban, 0 = ...	
			Yes / target	Total
Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	Not pass: G3 < 10	Count	56	100
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	56.0%	100.0%
		% within Address dummy: 1 = urban, 0 = rural	12.4%	15.4%

Crosstab

			Address dummy: 1 = ...	
			No / reference	
Pass: G3 >= 10		Count	153	
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	27.9%	
		% within Address dummy: 1 = urban, 0 = rural	77.7%	
Total		Count	197	
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	30.4%	
		% within Address dummy: 1 = urban, 0 = rural	100.0%	

Binary Logistic Prepared Data Summary
Outcome balance and predictor context

Crosstab

		Address dummy: 1 = urban, 0 = ...	
		Yes / target	Total
Pass: G3 >= 10	Count	396	549
	% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	72.1%	100.0%
	% within Address dummy: 1 = urban, 0 = rural	87.6%	84.6%
Total	Count	452	649
	% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	69.6%	100.0%
	% within Address dummy: 1 = urban, 0 = rural	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)	Exact Sig. (2- sided)	Exact Sig. (1- sided)
Pearson Chi-Square	10.412 ^a	1	.001		
Continuity Correction ^b	9.663	1	.002		
Likelihood Ratio	9.877	1	.002		
Fisher's Exact Test				.002	.001
Linear-by-Linear Association	10.396	1	.001		
N of Valid Cases	649				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 30.35.

b. Computed only for a 2x2 table

Binary Logistic Prepared Data Summary
Outcome balance and predictor context

Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass (Not pass: G3 < 10 / Pass: G3 >= 10)	2.034	1.314	3.147
For cohort Address dummy: 1 = urban, 0 = rural = No / reference	1.579	1.219	2.045
For cohort Address dummy: 1 = urban, 0 = rural = Yes / target	.776	.648	.931
N of Valid Cases	649		

Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass * Higher education intention dummy: yes

Crosstab

			Higher education ... No / reference
Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	Not pass: G3 < 10	Count	33
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	33.0%
		% within Higher education intention dummy: yes	47.8%

Binary Logistic Prepared Data Summary
Outcome balance and predictor context

Crosstab

			Higher education intention dummy: ..	
			Yes / target	Total
Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	Not pass: G3 < 10	Count	67	100
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	67.0%	100.0%
		% within Higher education intention dummy: yes	11.6%	15.4%

Crosstab

			Higher education ... No / reference
Pass: G3 >= 10		Count	36
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	6.6%
		% within Higher education intention dummy: yes	52.2%
Total		Count	69
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	10.6%
		% within Higher education intention dummy: yes	100.0%

Binary Logistic Prepared Data Summary
Outcome balance and predictor context

Crosstab

		Higher education intention dummy: ..	
		Yes / target	Total
Pass: G3 >= 10	Count	513	549
	% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	93.4%	100.0%
	% within Higher education intention dummy: yes	88.4%	84.6%
Total	Count	580	649
	% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	89.4%	100.0%
	% within Higher education intention dummy: yes	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)	Exact Sig. (2- sided)	Exact Sig. (1- sided)
Pearson Chi-Square	62.251 ^a	1	.000		
Continuity Correction ^b	59.499	1	.000		
Likelihood Ratio	47.101	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	62.155	1	.000		
N of Valid Cases	649				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 10.63.

b. Computed only for a 2x2 table

Binary Logistic Prepared Data Summary
Outcome balance and predictor context

Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass (Not pass: G3 < 10 / Pass: G3 >= 10)	7.019	4.104	12.003
For cohort Higher education intention dummy: yes = No / reference	5.033	3.301	7.671
For cohort Higher education intention dummy: yes = Yes / target	.717	.624	.824
N of Valid Cases	649		

Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass * Internet access dummy: yes

Crosstab

		Internet access .	
		No / reference	
Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	Not pass: G3 < 10	Count	32
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	32.0%
		% within Internet access dummy: yes	21.2%

Binary Logistic Prepared Data Summary
Outcome balance and predictor context

Crosstab

			Internet access ..	
			Yes / target	Total
Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	Not pass: G3 < 10	Count	68	100
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	68.0%	100.0%
		% within Internet access dummy: yes	13.7%	15.4%

Crosstab

			Internet access .	
			No / reference	
Pass: G3 >= 10		Count	119	
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	21.7%	
		% within Internet access dummy: yes	78.8%	
Total		Count	151	
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	23.3%	
		% within Internet access dummy: yes	100.0%	

Binary Logistic Prepared Data Summary
Outcome balance and predictor context

Crosstab

		Internet access ..	
		Yes / target	Total
Pass: G3 >= 10	Count	430	549
	% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	78.3%	100.0%
	% within Internet access dummy: yes	86.3%	84.6%
Total	Count	498	649
	% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	76.7%	100.0%
	% within Internet access dummy: yes	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.050 ^a	1	.025		
Continuity Correction ^b	4.489	1	.034		
Likelihood Ratio	4.756	1	.029		
Fisher's Exact Test				.029	.019
Linear-by-Linear Association	5.043	1	.025		
N of Valid Cases	649				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 23.27.

b. Computed only for a 2x2 table

Binary Logistic Prepared Data Summary
Outcome balance and predictor context

Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass (Not pass: G3 < 10 / Pass: G3 >= 10)	1.700	1.066	2.712
For cohort Internet access dummy: yes = No / reference	1.476	1.065	2.047
For cohort Internet access dummy: yes = Yes / target	.868	.754	1.000
N of Valid Cases	649		

Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass * Number of past class failures

Crosstab

			Number of past class ..	
			0	1
Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	Not pass: G3 < 10	Count	51	32
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	51.0%	32.0%
		% within Number of past class failures	9.3%	45.7%

Crosstab

			Number of past class ...	
			2	3
Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	Not pass: G3 < 10	Count	8	9
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	8.0%	9.0%
		% within Number of past class failures	50.0%	64.3%

Binary Logistic Prepared Data Summary
Outcome balance and predictor context

Crosstab

			Total
Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	Not pass: G3 < 10	Count	100
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	100.0%
		% within Number of past class failures	15.4%

Crosstab

		Number of past class ..	
		0	1
Pass: G3 >= 10	Count	498	38
	% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	90.7%	6.9%
	% within Number of past class failures	90.7%	54.3%
Total	Count	549	70
	% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	84.6%	10.8%
	% within Number of past class failures	100.0%	100.0%

Binary Logistic Prepared Data Summary
Outcome balance and predictor context

Crosstab

		Number of past class ...	
		2	3
Pass: G3 >= 10	Count	8	5
	% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	1.5%	0.9%
	% within Number of past class failures	50.0%	35.7%
Total	Count	16	14
	% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	2.5%	2.2%
	% within Number of past class failures	100.0%	100.0%

Crosstab

		Total
Pass: G3 >= 10	Count	549
	% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	100.0%
	% within Number of past class failures	84.6%
Total	Count	649
	% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	100.0%
	% within Number of past class failures	100.0%

Binary Logistic Prepared Data Summary
Outcome balance and predictor context

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	105.443 ^a	3	.000
Likelihood Ratio	81.342	3	.000
Linear-by-Linear Association	93.688	1	.000
N of Valid Cases	649		

a. 2 cells (25.0%) have expected count less than 5. The minimum expected count is 2.16.

Risk Estimate

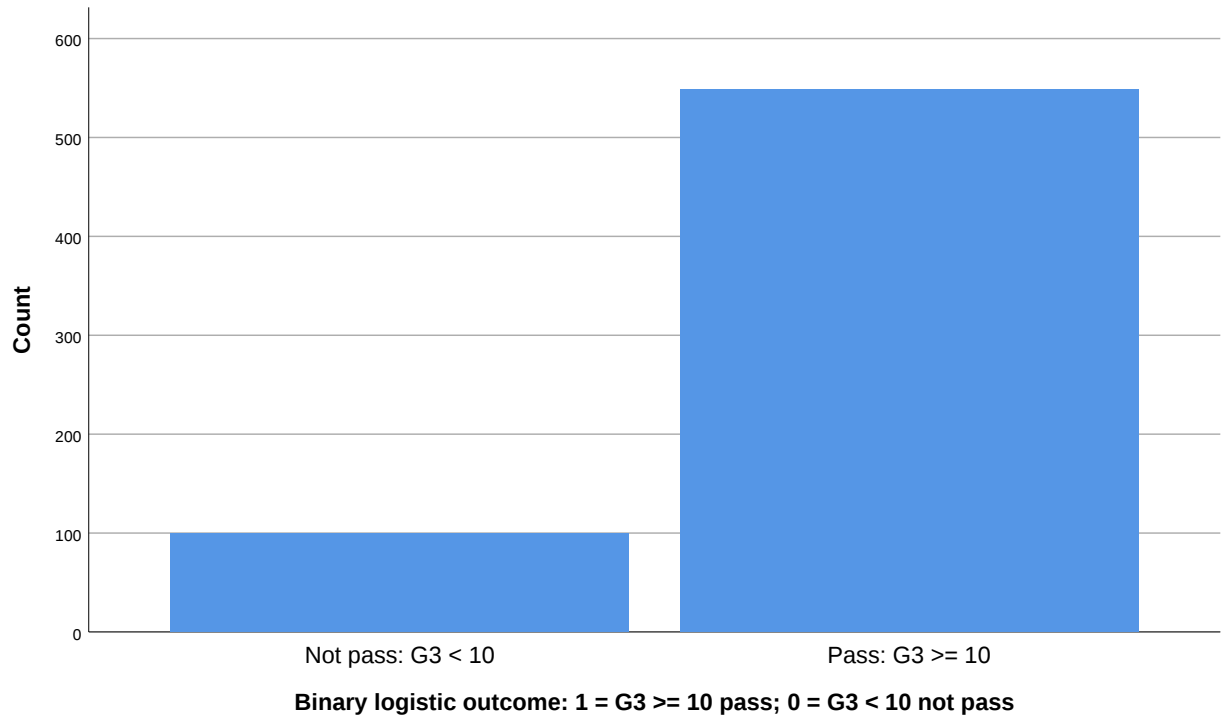
	Value
Odds Ratio for Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass (Not pass: G3 < 10 / Pass: G3 >= 10)	a

a. Risk Estimate statistics cannot be computed. They are only computed for a 2*2 table without empty cells.

Binary Logistic Outcome Distribution

Binary Logistic Outcome Distribution
Bar chart of pass versus not pass

Graph



Binary Logistic Predictor Distributions

Binary Logistic Predictor Distributions
Numeric predictors by binary outcome

Explore

Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass

Case Processing Summary

		Cases			
		Valid		Missing	
Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass		N	Percent	N	Percent
First period grade	Not pass: G3 < 10	100	100.0%	0	0.0%
	Pass: G3 >= 10	549	100.0%	0	0.0%
Second period grade	Not pass: G3 < 10	100	100.0%	0	0.0%
	Pass: G3 >= 10	549	100.0%	0	0.0%
Student age	Not pass: G3 < 10	100	100.0%	0	0.0%
	Pass: G3 >= 10	549	100.0%	0	0.0%
School absences	Not pass: G3 < 10	100	100.0%	0	0.0%
	Pass: G3 >= 10	549	100.0%	0	0.0%

Case Processing Summary

		Cases	
		Total	
Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass		N	Percent
First period grade	Not pass: G3 < 10	100	100.0%
	Pass: G3 >= 10	549	100.0%
Second period grade	Not pass: G3 < 10	100	100.0%
	Pass: G3 >= 10	549	100.0%
Student age	Not pass: G3 < 10	100	100.0%
	Pass: G3 >= 10	549	100.0%
School absences	Not pass: G3 < 10	100	100.0%
	Pass: G3 >= 10	549	100.0%

Binary Logistic Predictor Distributions
Numeric predictors by binary outcome

Descriptives

Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass		Statistic	
First period grade	Not pass: G3 < 10	Mean	7.78
		95% Confidence Interval for Mean	Lower Bound
			Upper Bound
		5% Trimmed Mean	7.81
		Median	8.00
		Variance	2.093
		Std. Deviation	1.447
		Minimum	4
		Maximum	11
		Range	7
		Interquartile Range	2
		Skewness	-.219
		Kurtosis	.081
	Pass: G3 >= 10	Mean	12.06
		95% Confidence Interval for Mean	Lower Bound
			Upper Bound
		5% Trimmed Mean	12.02
		Median	12.00
		Variance	5.708
		Std. Deviation	2.389
		Minimum	0
		Maximum	19
		Range	19
		Interquartile Range	4
		Skewness	.090
		Kurtosis	.695
Second period grade	Not pass: G3 < 10	Mean	7.53
		95% Confidence Interval for Mean	Lower Bound
			Upper Bound
		5% Trimmed Mean	7.78
		Median	8.00
		Variance	5.868

Binary Logistic Predictor Distributions
Numeric predictors by binary outcome

Descriptives

Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass		Std. Error	
First period grade	Not pass: G3 < 10	Mean	.145
		95% Confidence Interval for Mean	Lower Bound
			Upper Bound
		5% Trimmed Mean	
		Median	
		Variance	
		Std. Deviation	
		Minimum	
		Maximum	
		Range	
		Interquartile Range	
		Skewness	.241
		Kurtosis	.478
	Pass: G3 >= 10	Mean	.102
		95% Confidence Interval for Mean	Lower Bound
			Upper Bound
		5% Trimmed Mean	
		Median	
		Variance	
		Std. Deviation	
		Minimum	
		Maximum	
		Range	
		Interquartile Range	
		Skewness	.104
		Kurtosis	.208
Second period grade	Not pass: G3 < 10	Mean	.242
		95% Confidence Interval for Mean	Lower Bound
			Upper Bound
		5% Trimmed Mean	
		Median	
		Variance	

Binary Logistic Predictor Distributions
Numeric predictors by binary outcome

Descriptives

Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass		Statistic
	Std. Deviation	2.422
	Minimum	0
	Maximum	12
	Range	12
	Interquartile Range	2
	Skewness	-1.974
	Kurtosis	4.280
	Pass: G3 >= 10	
	Mean	12.31
	95% Confidence Interval for Mean	Lower Bound 12.11 Upper Bound 12.50
	5% Trimmed Mean	12.21
	Median	12.00
	Variance	5.457
	Std. Deviation	2.336
	Minimum	8
	Maximum	19
	Range	11
	Interquartile Range	3
	Skewness	.543
	Kurtosis	-.278
Student age	Not pass: G3 < 10	
	Mean	17.06
	95% Confidence Interval for Mean	Lower Bound 16.81 Upper Bound 17.31
	5% Trimmed Mean	17.03
	Median	17.00
	Variance	1.633
	Std. Deviation	1.278
	Minimum	15
	Maximum	22
	Range	7
	Interquartile Range	2
	Skewness	.419

Binary Logistic Predictor Distributions
Numeric predictors by binary outcome

Descriptives

Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass		Std. Error
	Std. Deviation	
	Minimum	
	Maximum	
	Range	
	Interquartile Range	
	Skewness	.241
	Kurtosis	.478
	Pass: G3 >= 10	
	Mean	.100
	95% Confidence Interval for Mean	Lower Bound
		Upper Bound
	5% Trimmed Mean	
	Median	
	Variance	
	Std. Deviation	
	Minimum	
	Maximum	
	Range	
	Interquartile Range	
	Skewness	.104
	Kurtosis	.208
Student age	Not pass: G3 < 10	
	Mean	.128
	95% Confidence Interval for Mean	Lower Bound
		Upper Bound
	5% Trimmed Mean	
	Median	
	Variance	
	Std. Deviation	
	Minimum	
	Maximum	
	Range	
	Interquartile Range	
	Skewness	.241

Binary Logistic Predictor Distributions
Numeric predictors by binary outcome

Descriptives

Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass				Statistic
	Pass: G3 >= 10	Kurtosis		.941
		Mean		16.69
		95% Confidence Interval for Mean	Lower Bound	16.59
			Upper Bound	16.79
		5% Trimmed Mean		16.63
		Median		17.00
		Variance		1.438
		Std. Deviation		1.199
		Minimum		15
		Maximum		21
		Range		6
		Interquartile Range		2
		Skewness		.405
		Kurtosis		-.138
School absences	Not pass: G3 < 10	Mean		4.61
		95% Confidence Interval for Mean	Lower Bound	3.52
			Upper Bound	5.70
		5% Trimmed Mean		3.97
		Median		2.50
		Variance		30.180
		Std. Deviation		5.494
		Minimum		0
		Maximum		26
		Range		26
		Interquartile Range		8
		Skewness		1.670
		Kurtosis		3.176
	Pass: G3 >= 10	Mean		3.49
		95% Confidence Interval for Mean	Lower Bound	3.11
			Upper Bound	3.86
		5% Trimmed Mean		2.94
		Median		2.00

Binary Logistic Predictor Distributions
Numeric predictors by binary outcome

Descriptives

Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass		Std. Error
	Kurtosis	.478
	Pass: G3 >= 10	
	Mean	.051
	95% Confidence Interval for Mean	
	Lower Bound	
	Upper Bound	
	5% Trimmed Mean	
	Median	
	Variance	
	Std. Deviation	
	Minimum	
	Maximum	
	Range	
	Interquartile Range	
	Skewness	.104
School absences	Kurtosis	.208
	Not pass: G3 < 10	
	Mean	.549
	95% Confidence Interval for Mean	
	Lower Bound	
	Upper Bound	
	5% Trimmed Mean	
	Median	
	Variance	
	Std. Deviation	
	Minimum	
	Maximum	
	Range	
	Interquartile Range	
	Skewness	.241
	Kurtosis	.478
	Pass: G3 >= 10	
	Mean	.190
	95% Confidence Interval for Mean	
	Lower Bound	
	Upper Bound	
	5% Trimmed Mean	
	Median	

Binary Logistic Predictor Distributions
Numeric predictors by binary outcome

Descriptives

Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass		Statistic
	Variance	19.820
	Std. Deviation	4.452
	Minimum	0
	Maximum	32
	Range	32
	Interquartile Range	6
	Skewness	2.089
	Kurtosis	6.547

Descriptives

Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass		Std. Error
	Variance	
	Std. Deviation	
	Minimum	
	Maximum	
	Range	
	Interquartile Range	
	Skewness	.104
	Kurtosis	.208

Tests of Normality

Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass		Kolmogorov-Smirnov ^a			Shapiro-...
		Statistic	df	Sig.	Statistic
First period grade	Not pass: G3 < 10	.145	100	.000	.952
	Pass: G3 >= 10	.114	549	.000	.970
Second period grade	Not pass: G3 < 10	.247	100	.000	.754
	Pass: G3 >= 10	.135	549	.000	.953
Student age	Not pass: G3 < 10	.149	100	.000	.916
	Pass: G3 >= 10	.181	549	.000	.913
School absences	Not pass: G3 < 10	.201	100	.000	.804
	Pass: G3 >= 10	.217	549	.000	.767

Binary Logistic Predictor Distributions
Numeric predictors by binary outcome

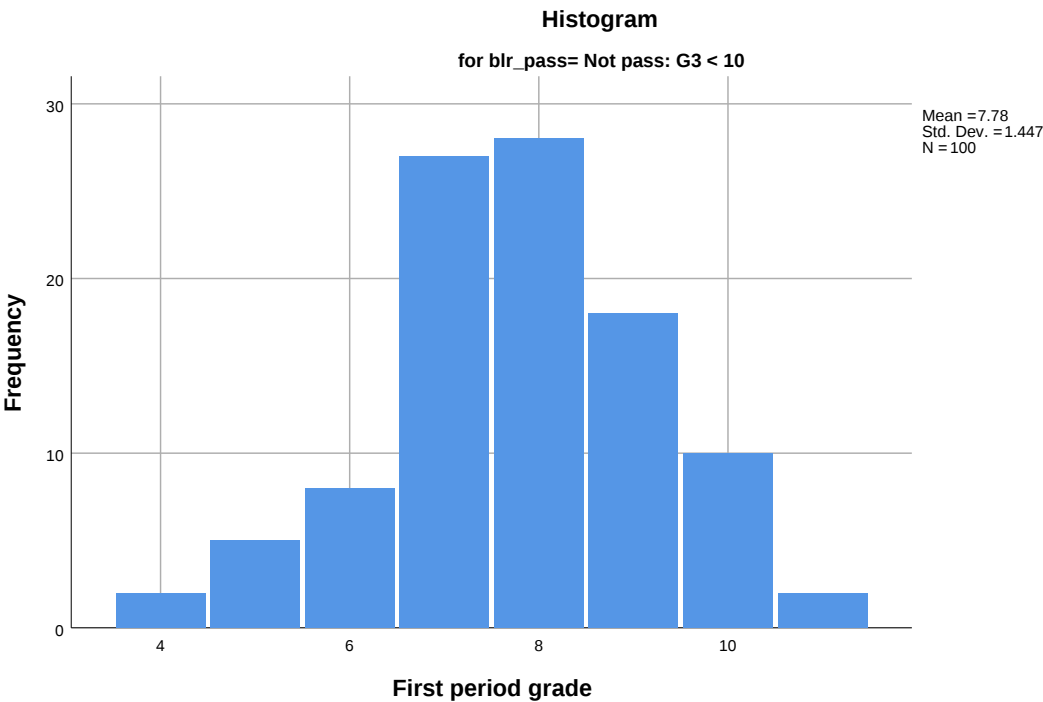
Tests of Normality

Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass		Shapiro-Wilk	
		df	Sig.
First period grade	Not pass: G3 < 10	100	.001
	Pass: G3 >= 10	549	.000
Second period grade	Not pass: G3 < 10	100	.000
	Pass: G3 >= 10	549	.000
Student age	Not pass: G3 < 10	100	.000
	Pass: G3 >= 10	549	.000
School absences	Not pass: G3 < 10	100	.000
	Pass: G3 >= 10	549	.000

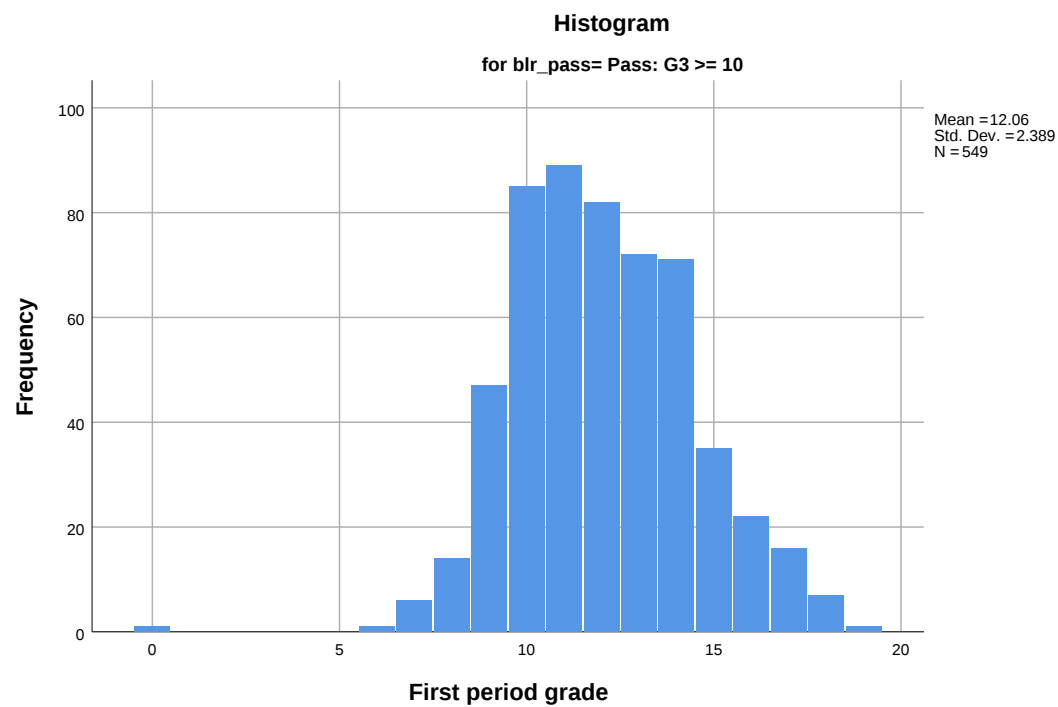
a. Lilliefors Significance Correction

First period grade

Histograms

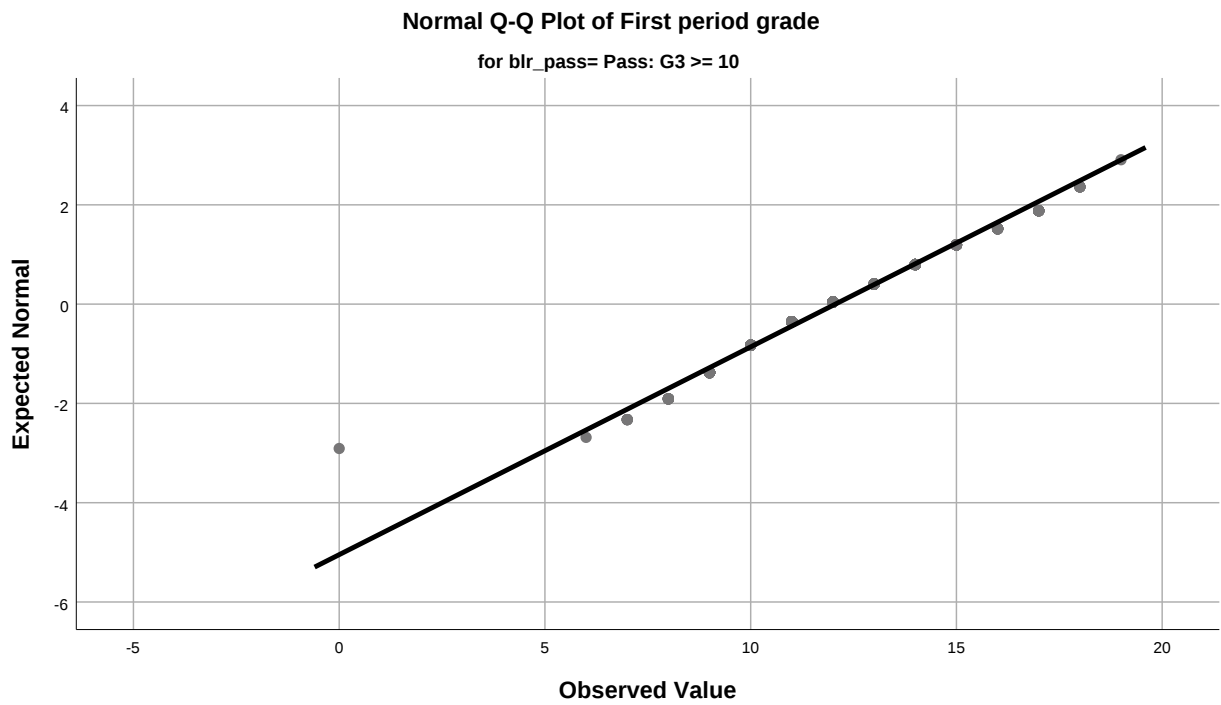
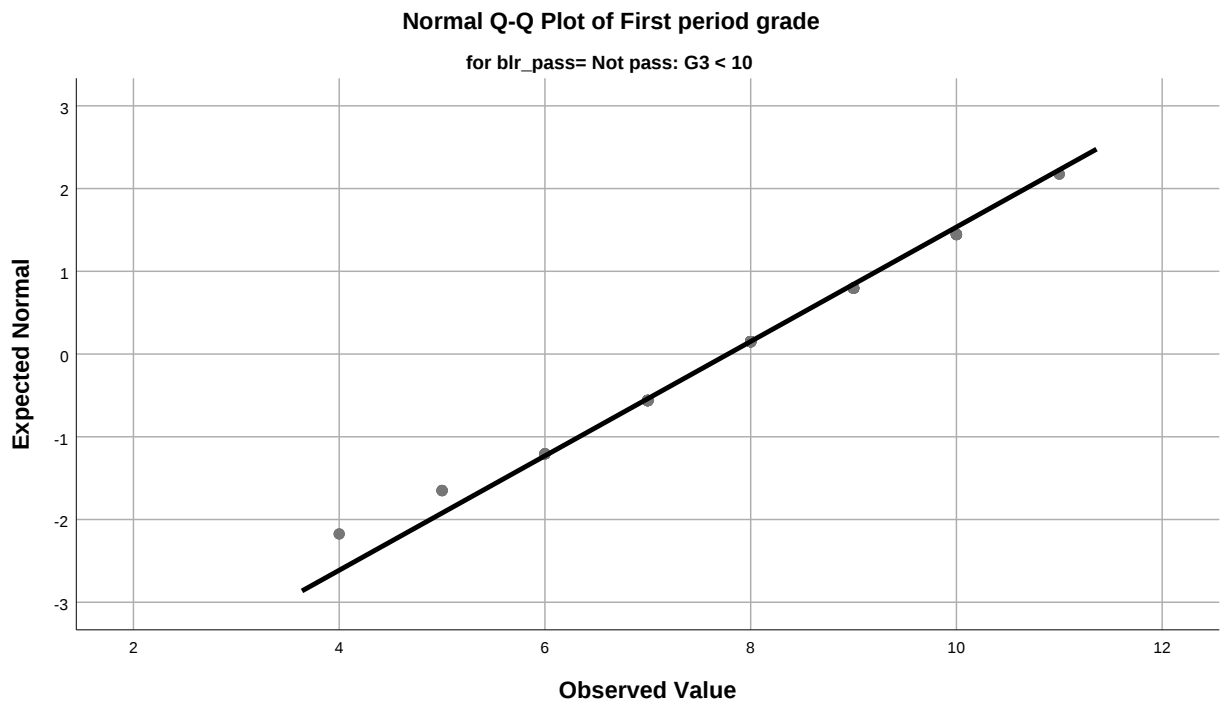


Binary Logistic Predictor Distributions
Numeric predictors by binary outcome



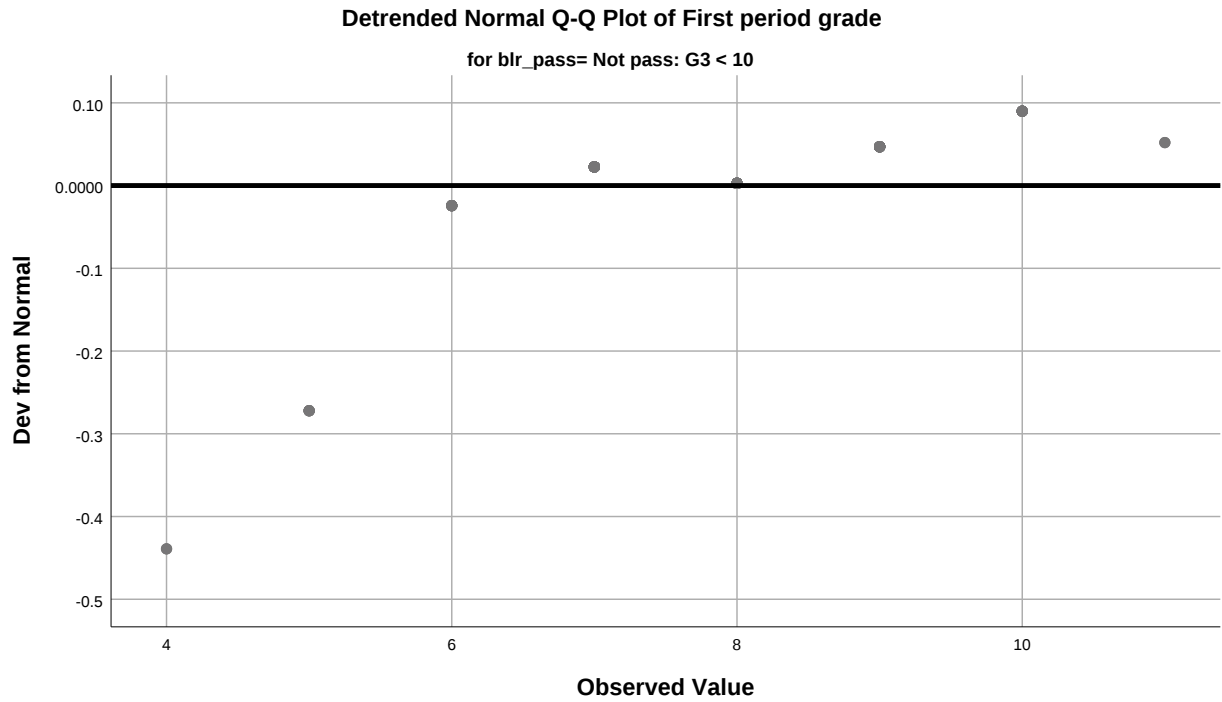
Normal Q-Q Plots

Binary Logistic Predictor Distributions
Numeric predictors by binary outcome

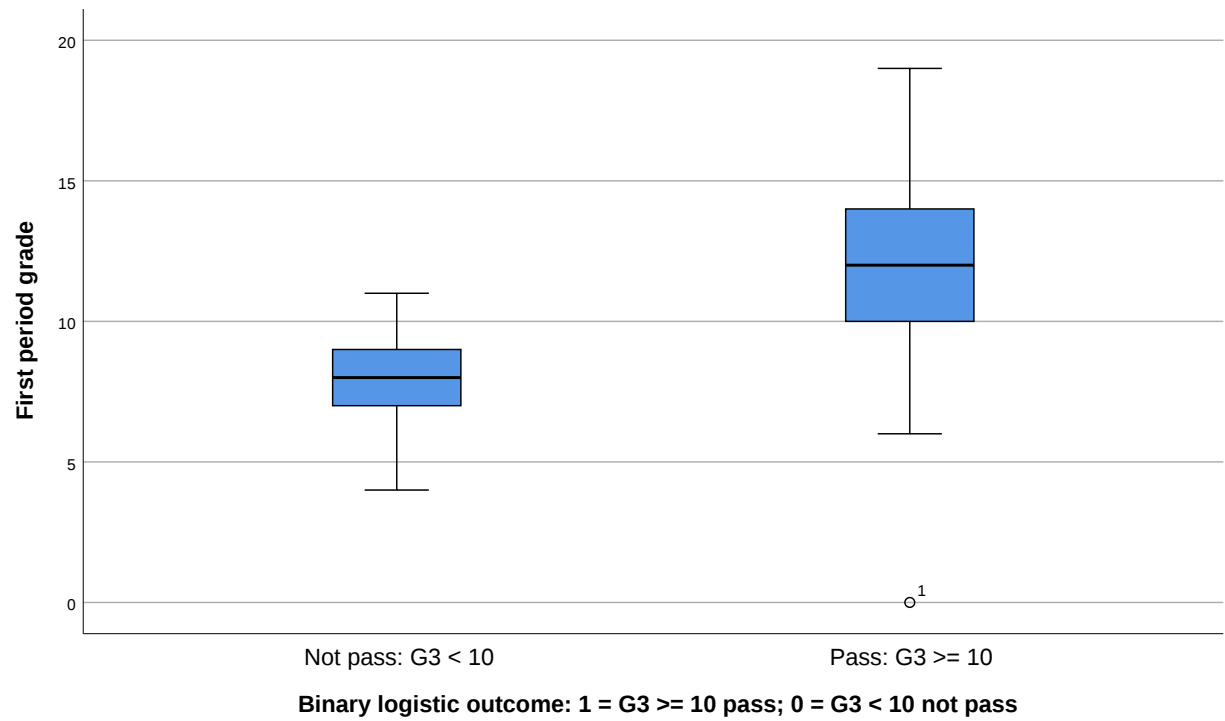
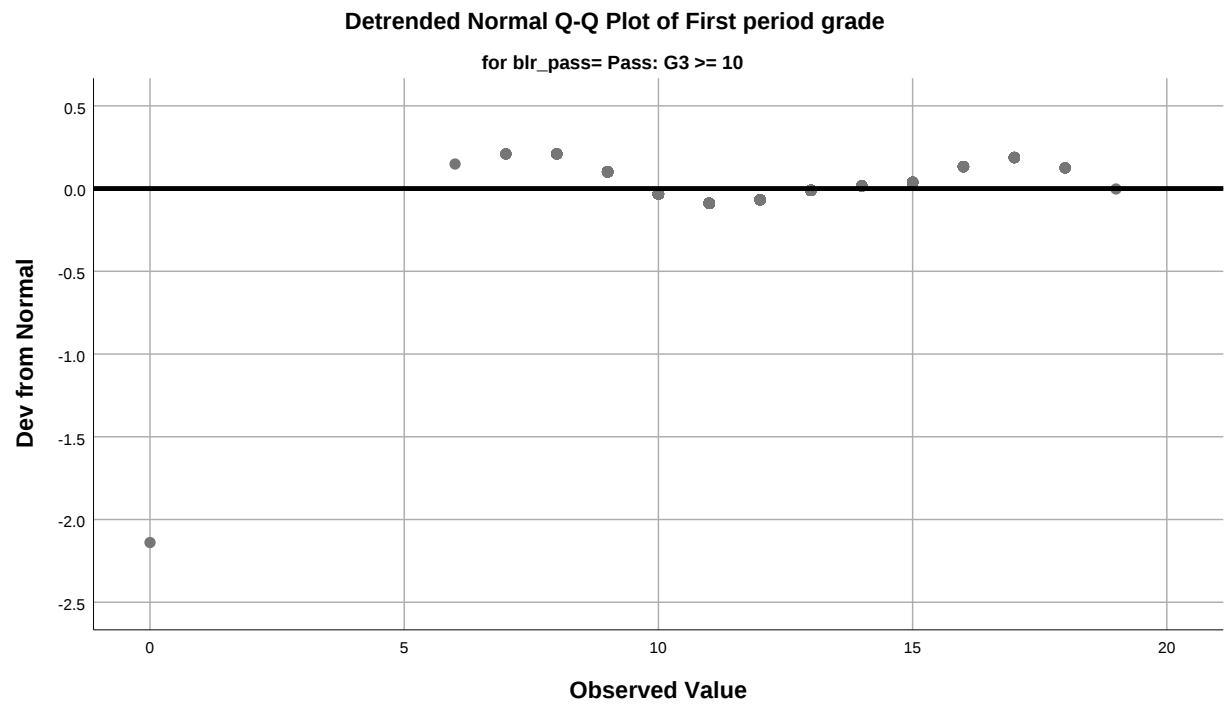


Binary Logistic Predictor Distributions
Numeric predictors by binary outcome

Detrended Normal Q-Q Plots



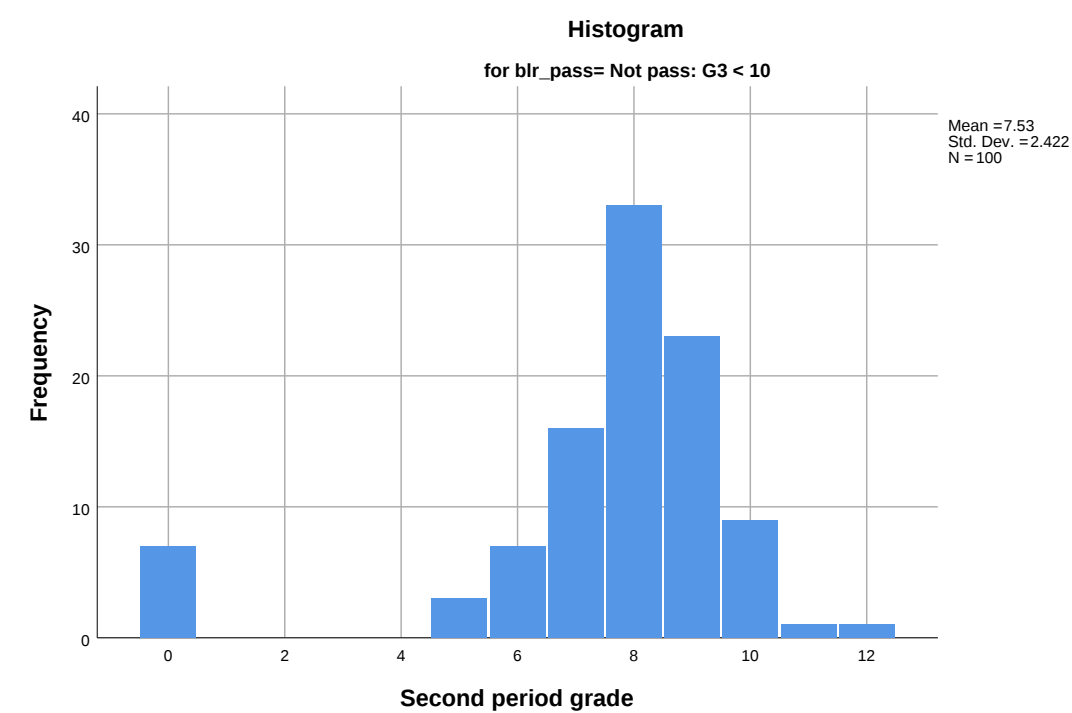
Binary Logistic Predictor Distributions
Numeric predictors by binary outcome



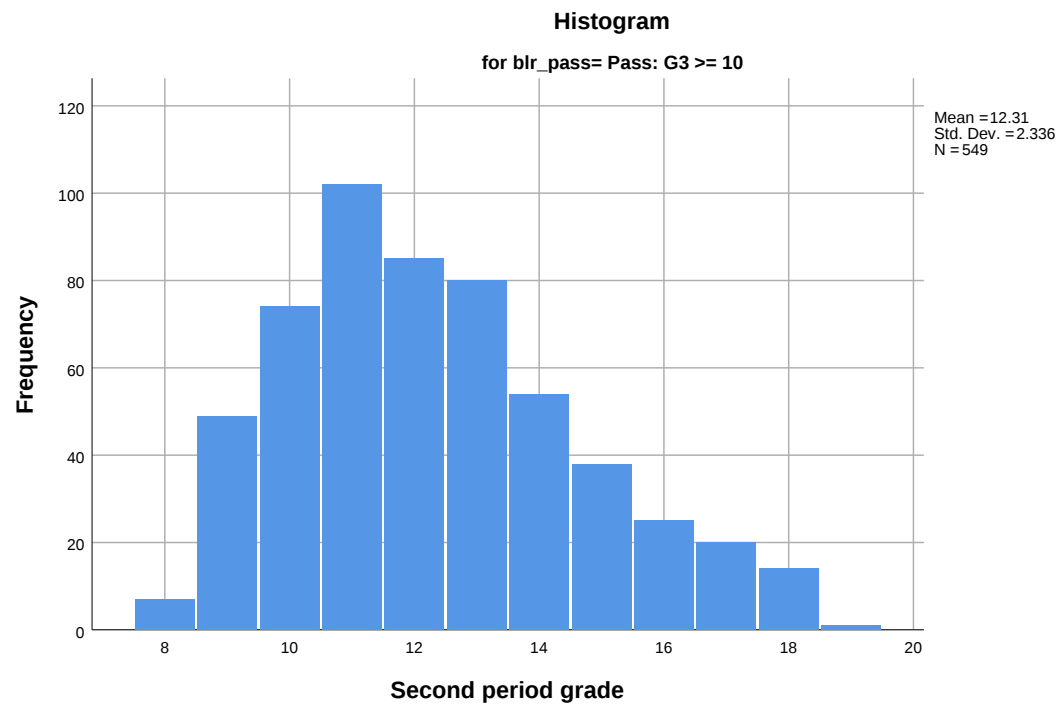
Binary Logistic Predictor Distributions
Numeric predictors by binary outcome

Second period grade

Histograms

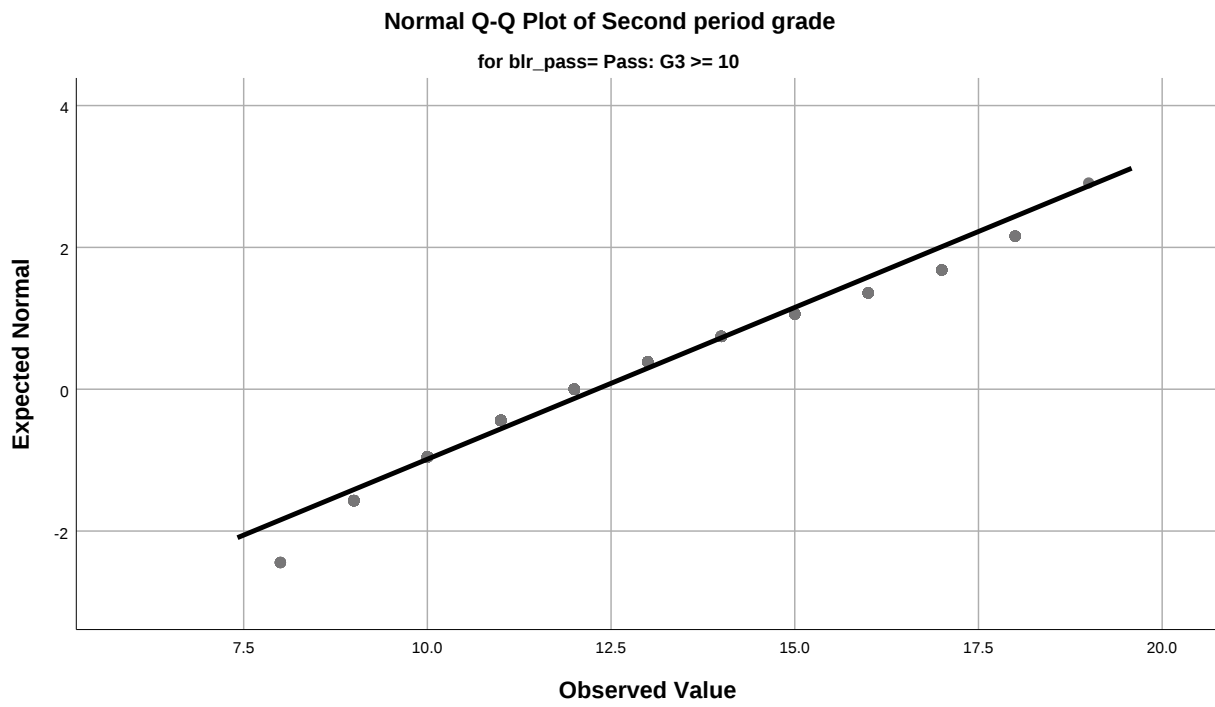
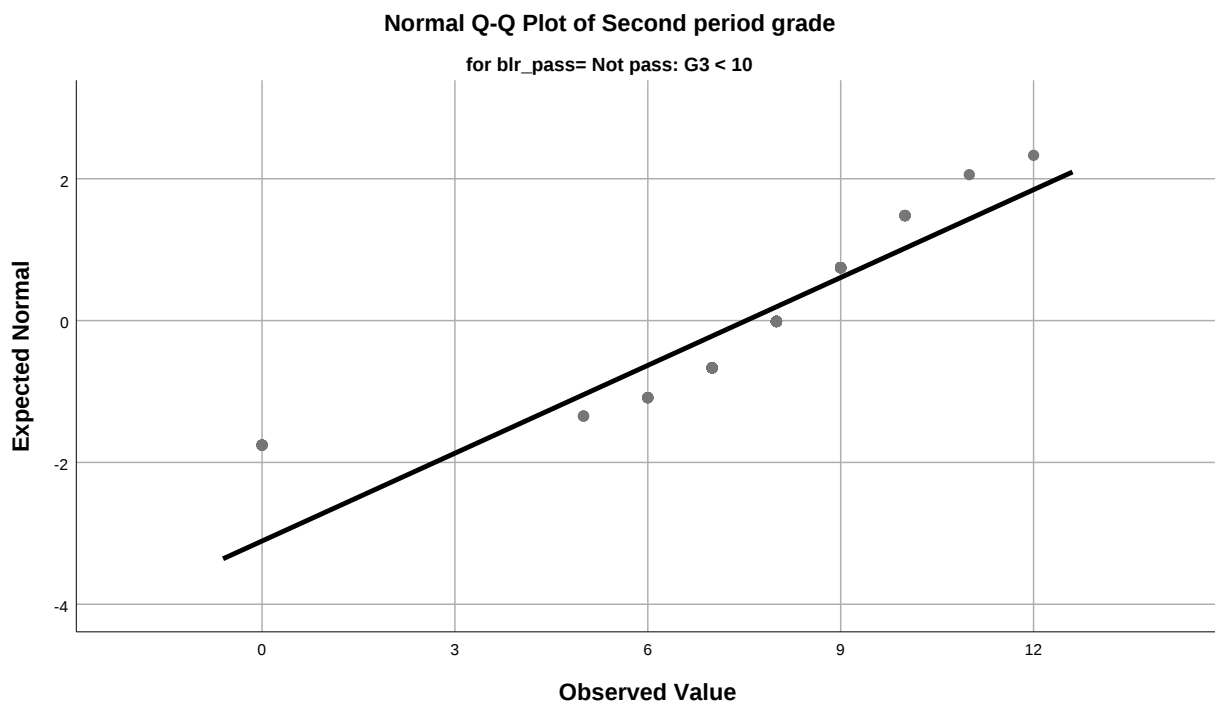


Binary Logistic Predictor Distributions
Numeric predictors by binary outcome



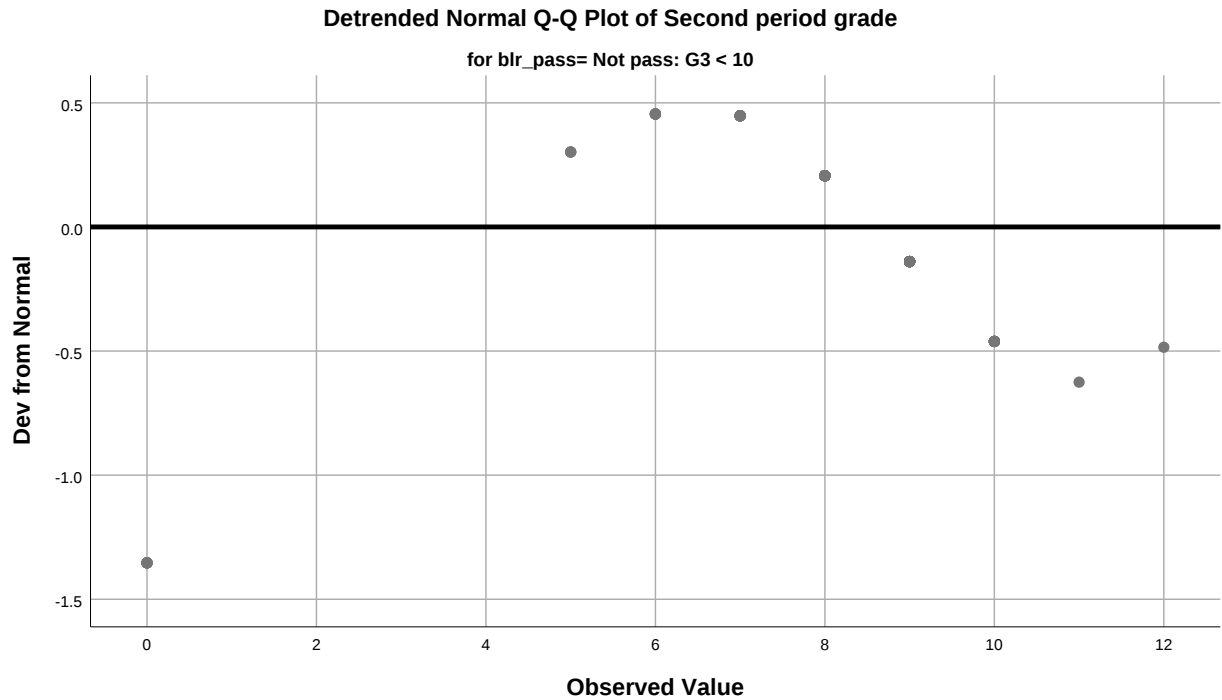
Normal Q-Q Plots

Binary Logistic Predictor Distributions
Numeric predictors by binary outcome

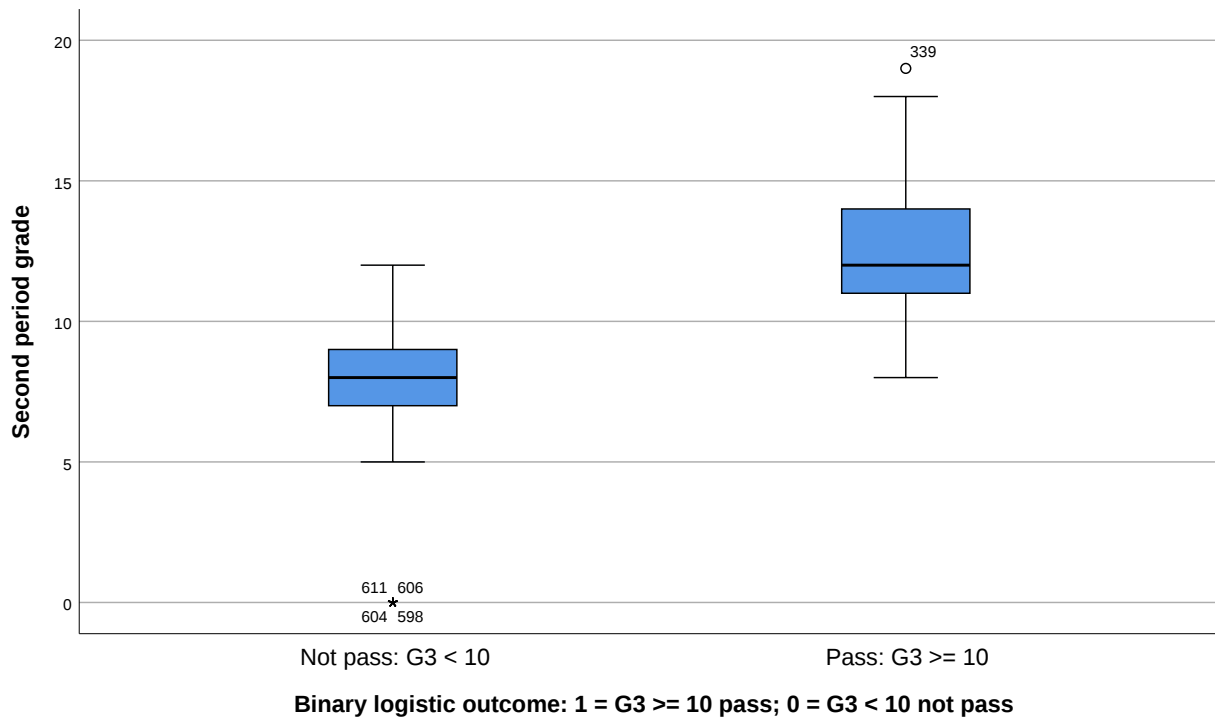
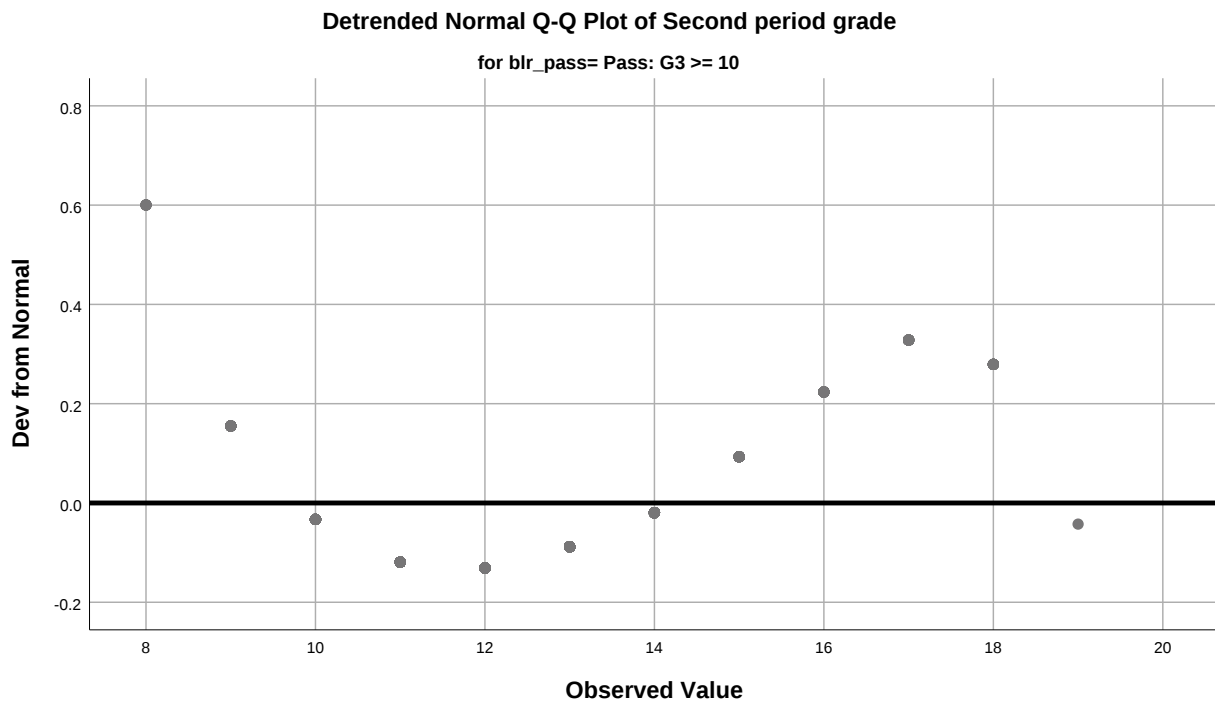


Binary Logistic Predictor Distributions
Numeric predictors by binary outcome

Detrended Normal Q-Q Plots

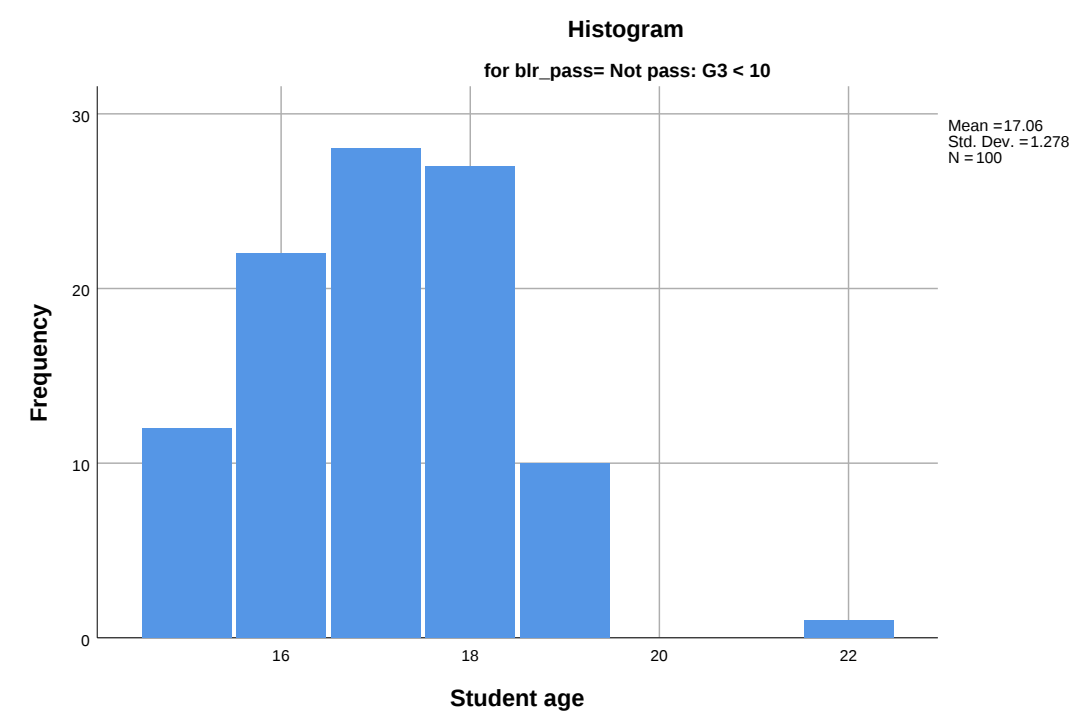


Binary Logistic Predictor Distributions
Numeric predictors by binary outcome

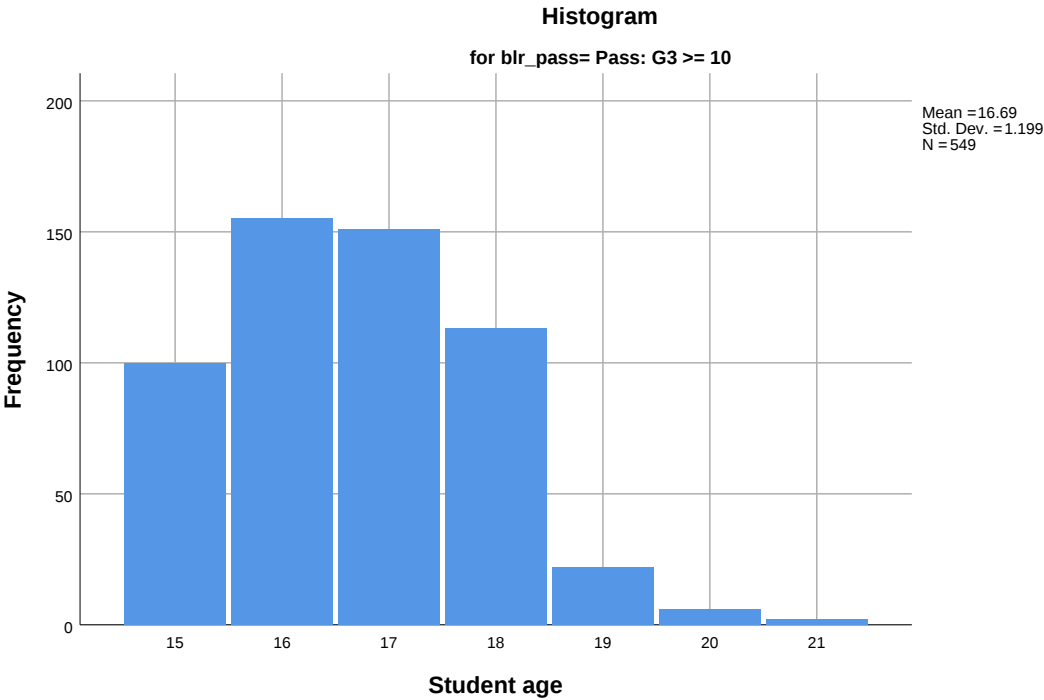


Binary Logistic Predictor Distributions
Numeric predictors by binary outcome

Student age
Histograms

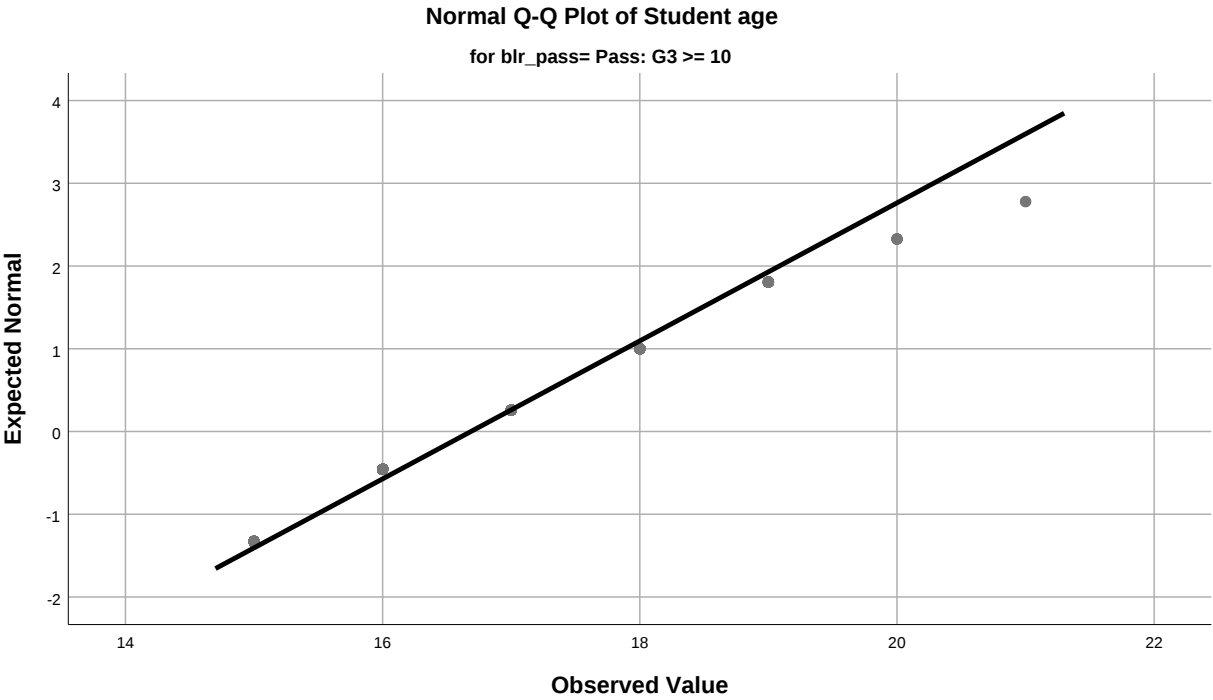
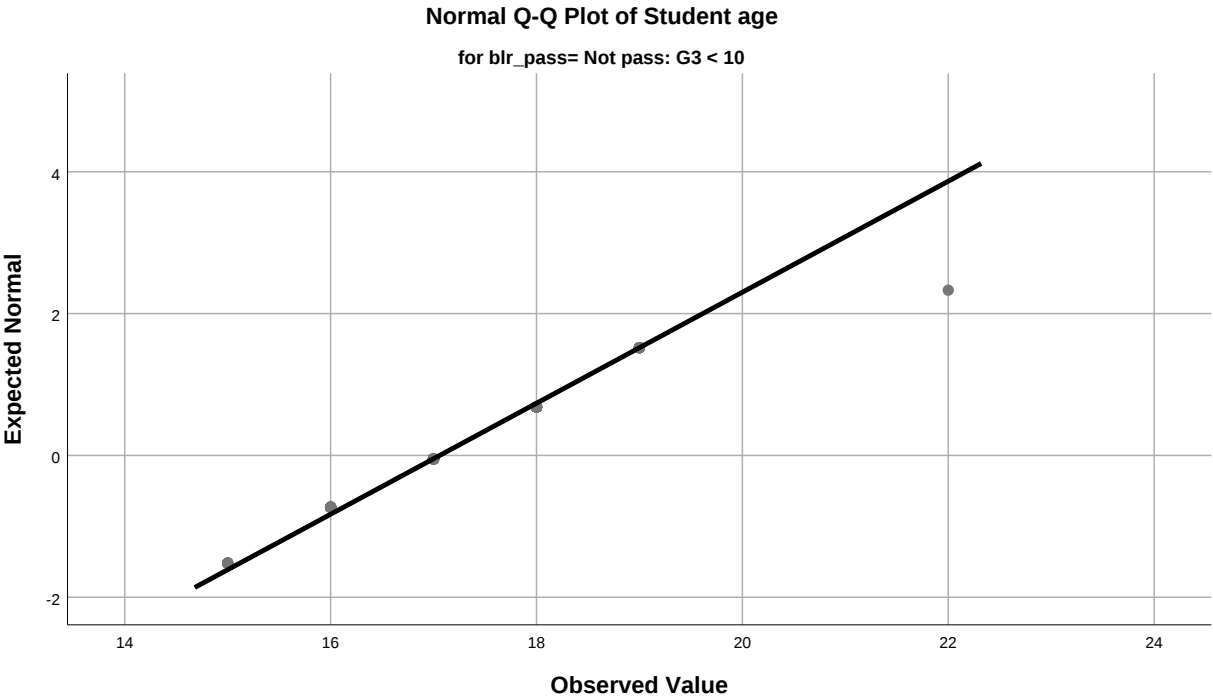


Binary Logistic Predictor Distributions
Numeric predictors by binary outcome



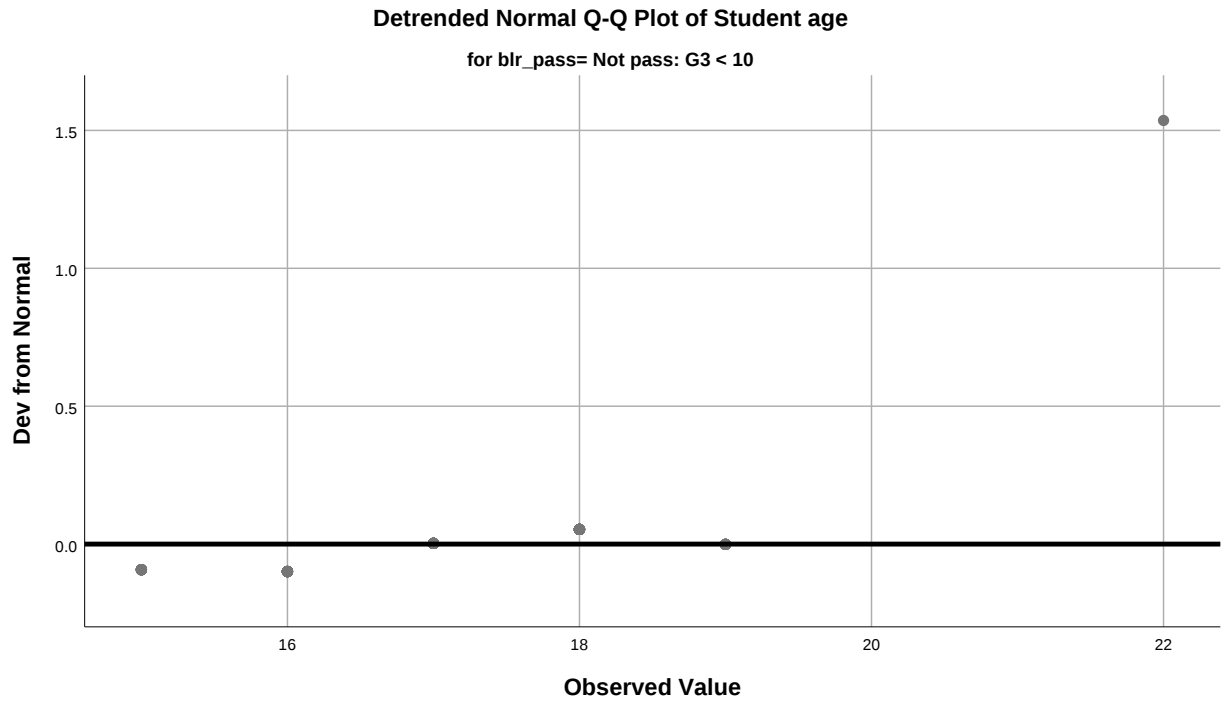
Normal Q-Q Plots

Binary Logistic Predictor Distributions
Numeric predictors by binary outcome

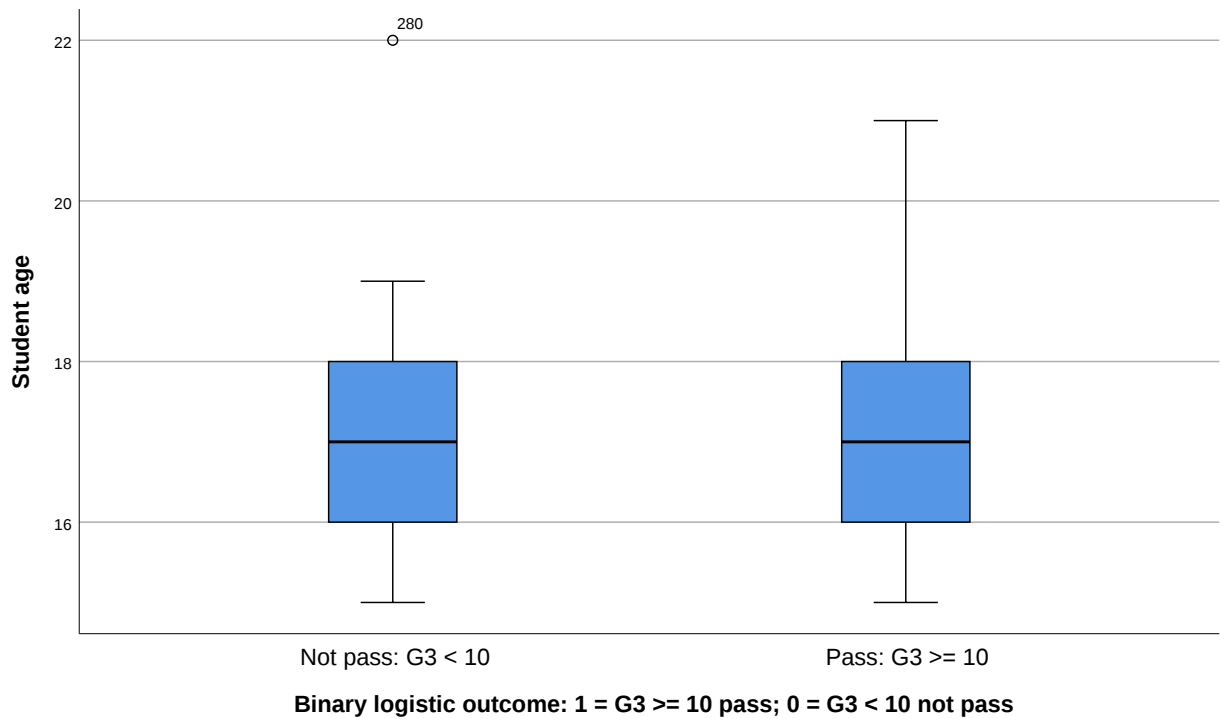
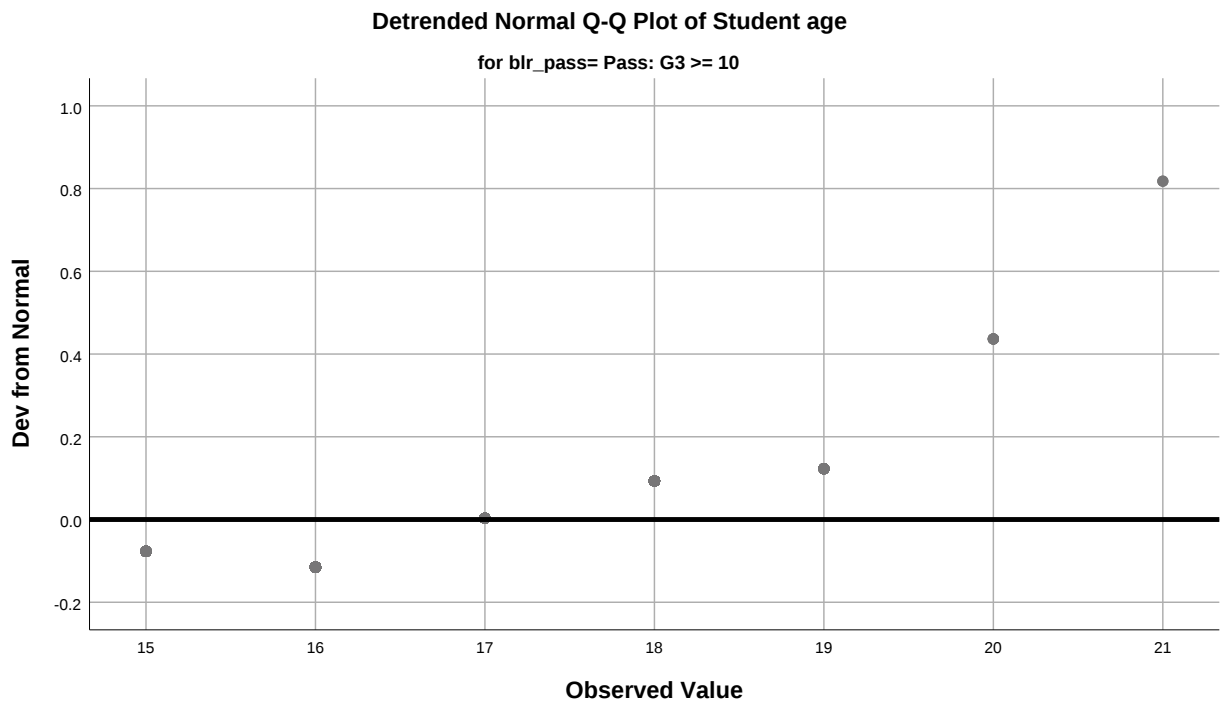


Binary Logistic Predictor Distributions
Numeric predictors by binary outcome

Detrended Normal Q-Q Plots



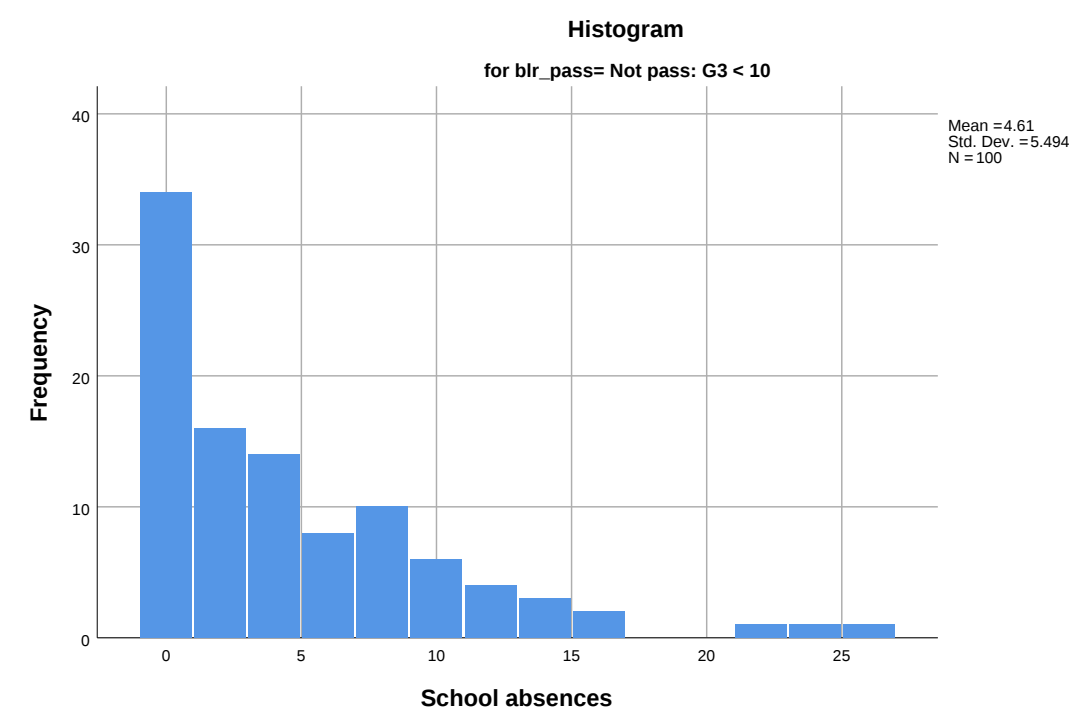
Binary Logistic Predictor Distributions
Numeric predictors by binary outcome



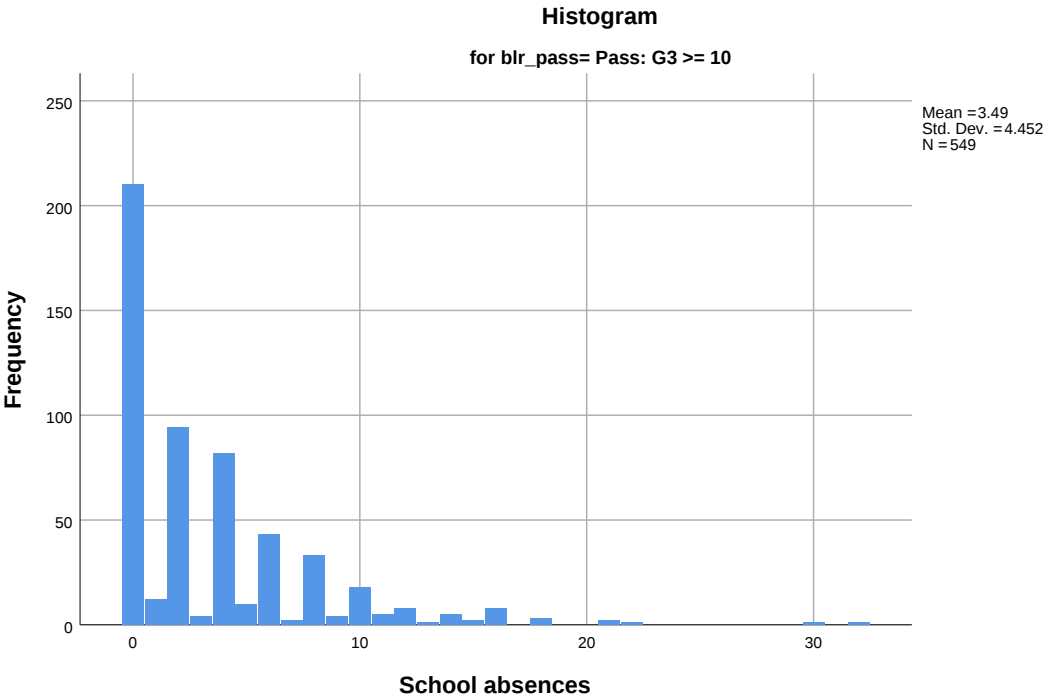
Binary Logistic Predictor Distributions
Numeric predictors by binary outcome

School absences

Histograms

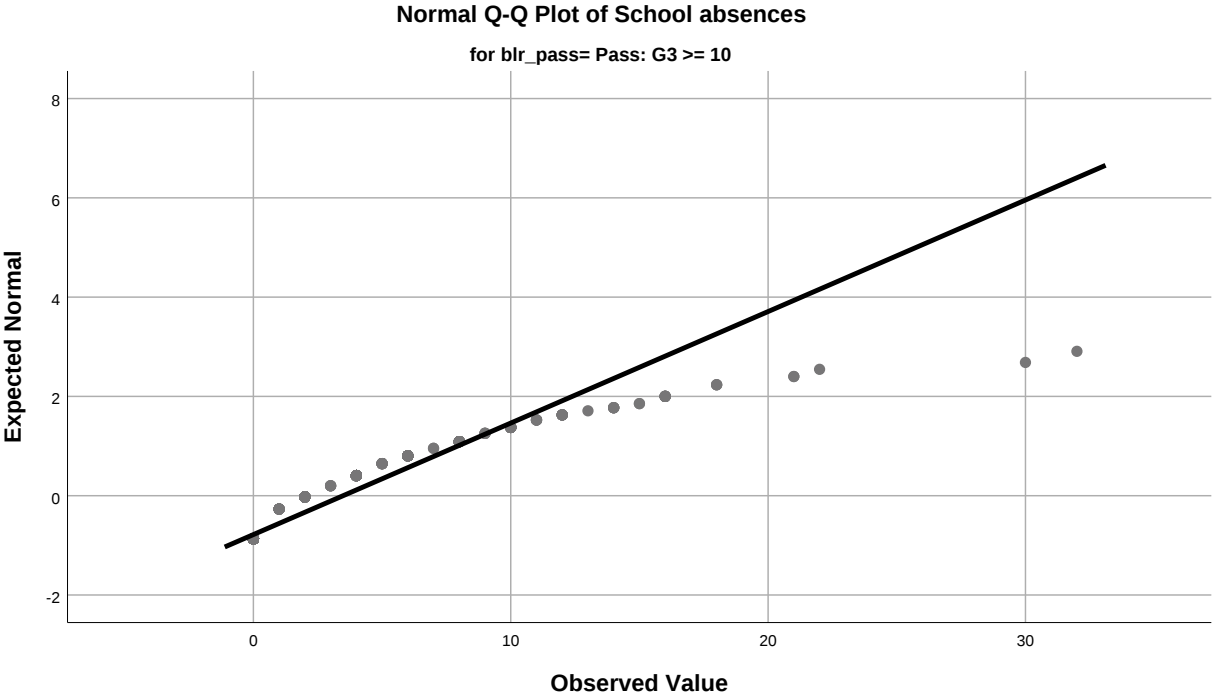
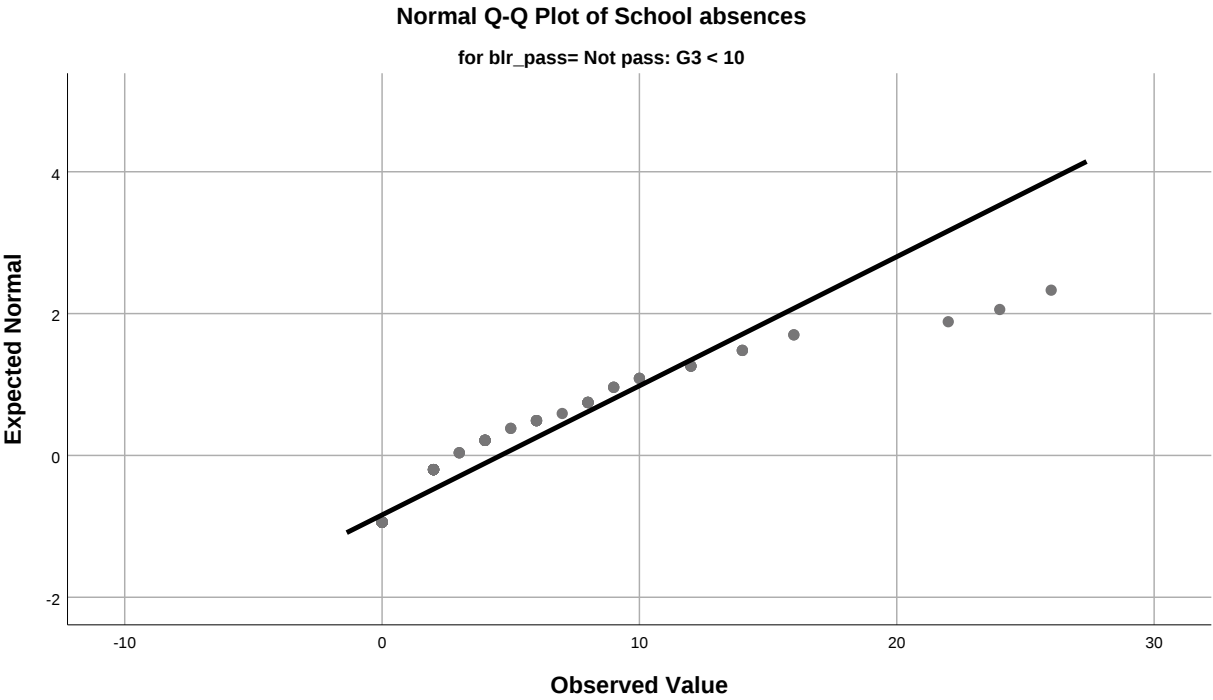


Binary Logistic Predictor Distributions
Numeric predictors by binary outcome

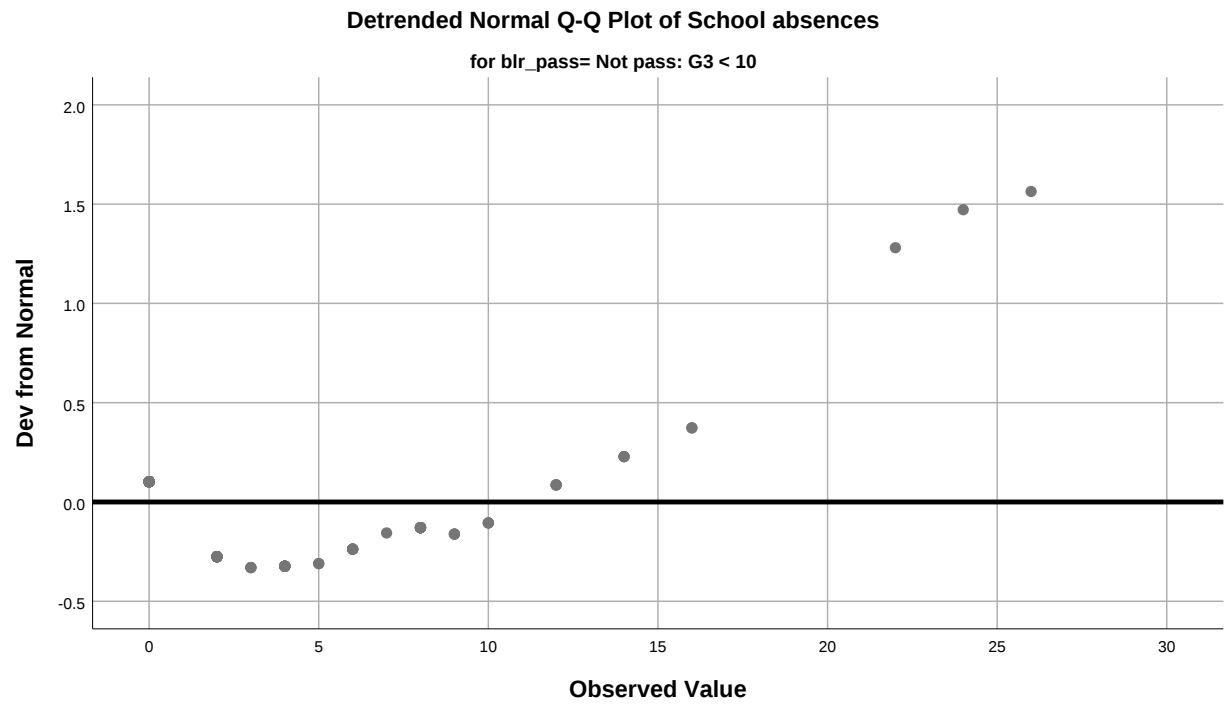


Normal Q-Q Plots

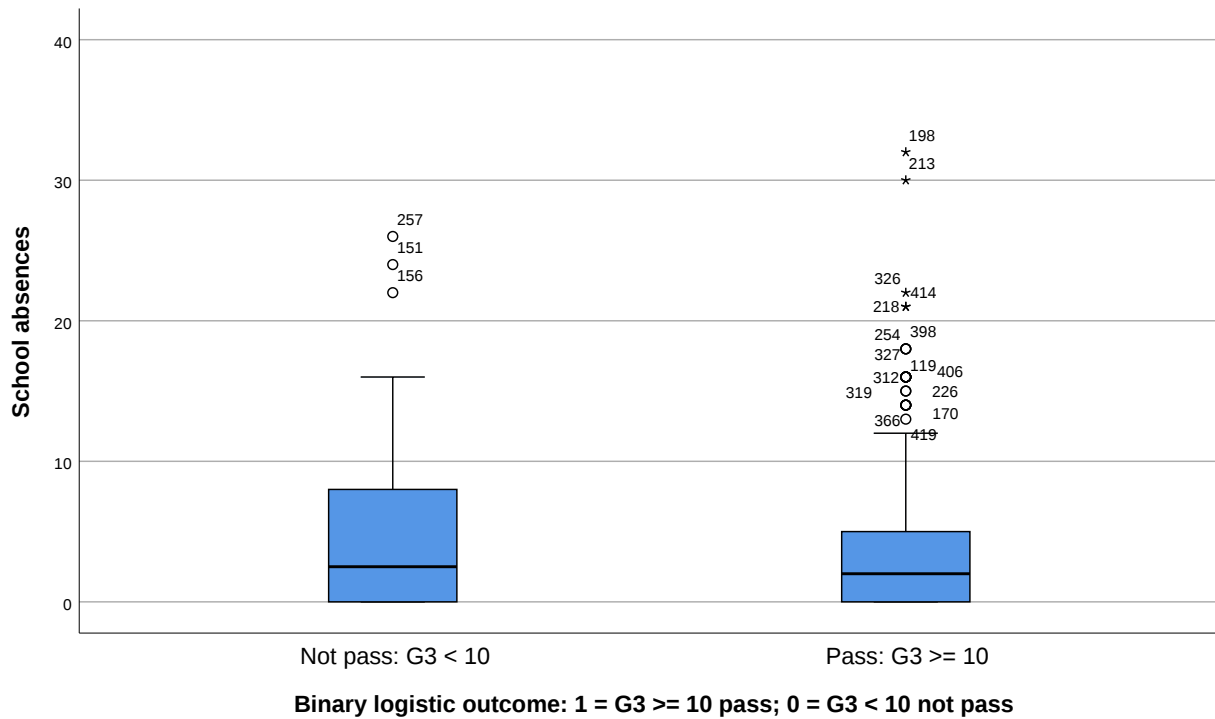
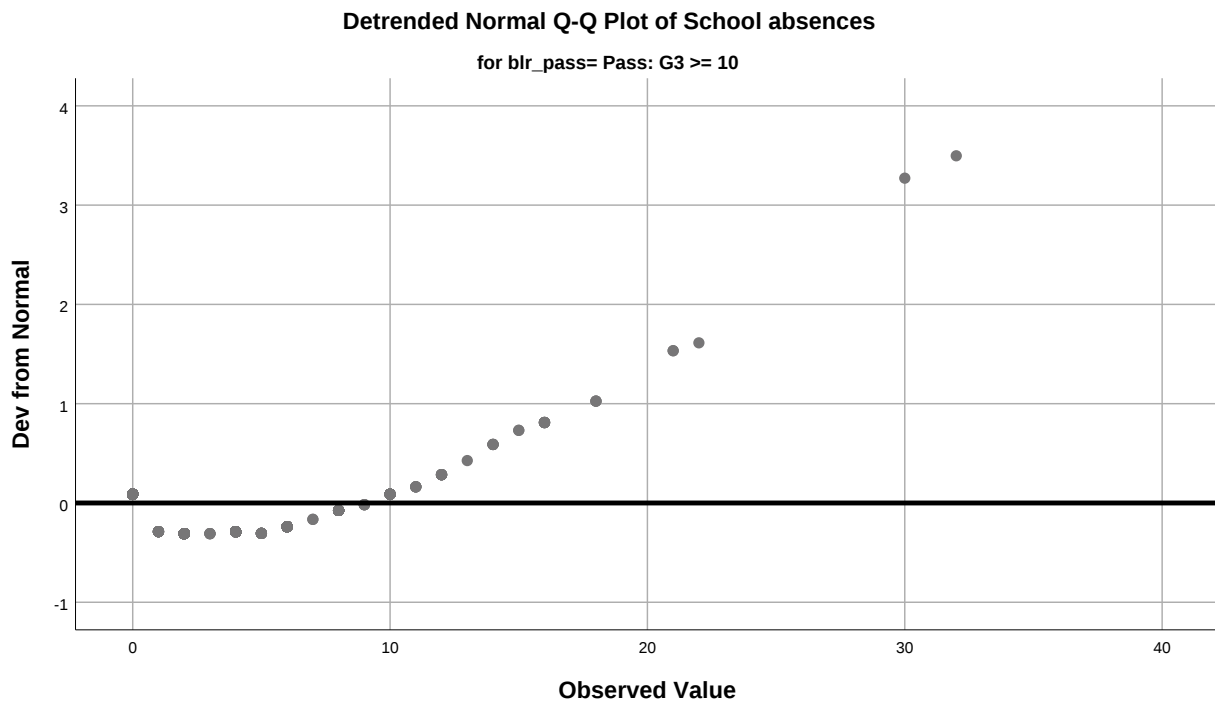
Binary Logistic Predictor Distributions
Numeric predictors by binary outcome



Detrended Normal Q-Q Plots



Binary Logistic Predictor Distributions
Numeric predictors by binary outcome



Binary Logistic Regression Model

>Warning # 2004. Command name: SUBTITLE

>The subtitle given exceeds 60 characters in length. The first 60 characters
>will be used.

Binary Logistic Regression Model
Logit model with odds ratios and 95 percent confidence inter

Logistic Regression

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
Not pass: G3 < 10	0
Pass: G3 >= 10	1

Block 0: Beginning Block

Classification Table^{a,b}

			Predicted	
			Not pass: G3 < 10	Pass: G3 >= 10
Step 0	Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	Not pass: G3 < 10	0	100
		Pass: G3 >= 10	0	549
	Overall Percentage			

Binary Logistic Regression Model
Logit model with odds ratios and 95 percent confidence inter

Classification Table^{a,b}

Observed		Predicted
		Percentage Correct
Step 0	Binary logistic outcome: 1 = Not pass: G3 < 10	.0
	G3 >= 10 pass; 0 = G3 < 10 not pass	100.0
	Pass: G3 >= 10	
Overall Percentage		84.6

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	1.703	.109	245.313	1	.000	5.490

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	First period grade	205.764	1	.000
		Second period grade	227.644	1	.000
		Weekly study time group	17.693	1	.000
		Number of past class failures	93.833	1	.000
		School absences	4.967	1	.026
		Student age	7.956	1	.005
		Mother education	13.608	1	.000
		Father education	13.881	1	.000
		Home to school travel time	2.173	1	.140
		Current health status	.065	1	.799
		School dummy: 1 = MS, 0 = GP	57.331	1	.000
		Sex dummy: 1 = male, 0 = female	3.971	1	.046

Binary Logistic Regression Model
Logit model with odds ratios and 95 percent confidence inter

Variables not in the Equation

	Score	df	Sig.
Address dummy: 1 = urban, 0 = rural	10.412	1	.001
Higher education intention dummy: yes	62.251	1	.000
Internet access dummy: yes	5.050	1	.025
School educational support dummy: yes	.774	1	.379
Family educational support dummy: yes	.932	1	.334
Extra paid classes dummy: yes	1.872	1	.171
Extra-curricular activities dummy: yes	1.451	1	.228
Overall Statistics	273.837	19	.000

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	391.774	19	.000
	Block	391.774	19	.000
	Model	391.774	19	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	166.012 ^a	.453	.786

a. Estimation terminated at iteration number 9 because parameter estimates changed by less than .001.

Binary Logistic Regression Model
Logit model with odds ratios and 95 percent confidence inter

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	19.625	8	.012

Contingency Table for Hosmer and Lemeshow Test

		Binary logistic outcome: 1 = G3 ≥ 10 pass; 0 = G3 < 10 not pass = Not pass: G3 < 10		Binary logistic outcome: 1 = G3 ≥ 10 pass; 0 = G3 < 10 not pass = Pass: G3 ≥ 10		Total
		Observed	Expected	Observed	Expected	
Step 1	1	61	60.983	4	4.017	65
	2	32	30.471	33	34.529	65
	3	6	6.981	59	58.019	65
	4	0	1.226	65	63.774	65
	5	0	.279	65	64.721	65
	6	1	.051	64	64.949	65
	7	0	.008	65	64.992	65
	8	0	.001	65	64.999	65
	9	0	.000	65	65.000	65
	10	0	.000	64	64.000	64

Classification Table^a

		Predicted	
		Binary logistic outcome: 1 = G3 ≥ 10 pass; 0 = G3 < 10 not pass Not pass: G3 < 10 Pass: G3 ≥ 10	
Observed			
Step 1	Binary logistic outcome: 1 = G3 ≥ 10 pass; 0 = G3 < 10 not pass	Not pass: G3 < 10	75
		Pass: G3 ≥ 10	25
Overall Percentage			535

Binary Logistic Regression Model
Logit model with odds ratios and 95 percent confidence inter

Classification Table^a

			Predicted
Observed			Percentage Correct
Step 1	Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	Not pass: G3 < 10	75.0
		Pass: G3 >= 10	97.4
	Overall Percentage		94.0

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.
Step 1 ^a	First period grade	.699	.157	19.799	1	.000
	Second period grade	1.555	.241	41.609	1	.000
	Weekly study time group	.057	.292	.038	1	.846
	Number of past class failures	-.296	.267	1.222	1	.269
	School absences	-.047	.047	1.007	1	.316
	Student age	.587	.202	8.428	1	.004
	Mother education	.096	.241	.160	1	.689
	Father education	-.080	.248	.103	1	.748
	Home to school travel time	.242	.271	.803	1	.370
	Current health status	-.200	.161	1.547	1	.214
	School dummy: 1 = MS, 0 = GP	-1.178	.495	5.650	1	.017
	Sex dummy: 1 = male, 0 = female	-.637	.455	1.963	1	.161
	Address dummy: 1 = urban, 0 = rural	.031	.456	.005	1	.945
	Higher education intention dummy: yes	.968	.534	3.290	1	.070

Binary Logistic Regression Model
Logit model with odds ratios and 95 percent confidence inter

Variables in the Equation

		Exp(B)	95% C.I. for EXP(B)	
			Lower	Upper
Step 1 ^a	First period grade	2.012	1.479	2.737
	Second period grade	4.736	2.952	7.596
	Weekly study time group	1.059	.597	1.877
	Number of past class failures	.744	.441	1.257
	School absences	.954	.871	1.046
	Student age	1.799	1.210	2.675
	Mother education	1.101	.687	1.765
	Father education	.923	.568	1.500
	Home to school travel time	1.274	.750	2.166
	Current health status	.819	.598	1.122
	School dummy: 1 = MS, 0 = GP	.308	.117	.813
	Sex dummy: 1 = male, 0 = female	.529	.217	1.289
	Address dummy: 1 = urban, 0 = rural	1.032	.422	2.522
	Higher education intention dummy: yes	2.633	.925	7.496

Variables in the Equation

		B	S.E.	Wald	df	Sig.
	Internet access dummy: yes	-.462	.497	.864	1	.353
	School educational support dummy: yes	.228	.657	.120	1	.729
	Family educational support dummy: yes	.201	.442	.206	1	.650
	Extra paid classes dummy: yes	-1.245	.828	2.260	1	.133
	Extra-curricular activities dummy: yes	.139	.424	.108	1	.743
	Constant	-28.707	4.956	33.546	1	.000

Binary Logistic Regression Model
Logit model with odds ratios and 95 percent confidence inter

Variables in the Equation

	Exp(B)	95% C.I. for EXP(B)	
		Lower	Upper
Internet access dummy: yes	.630	.238	1.669
School educational support dummy: yes	1.256	.346	4.556
Family educational support dummy: yes	1.222	.514	2.906
Extra paid classes dummy: yes	.288	.057	1.460
Extra-curricular activities dummy: yes	1.149	.501	2.639
Constant	.000		

- a. Variable(s) entered on step 1: First period grade, Second period grade, Weekly study time group, Number of past class failures, School absences, Student age, Mother education, Father education, Home to school travel time, Current health status, School dummy: 1 = MS, 0 = GP, Sex dummy: 1 = male, 0 = female, Address dummy: 1 = urban, 0 = rural, Higher education intention dummy: yes, Internet access dummy: yes, School educational support dummy: yes, Family educational support dummy: yes, Extra paid classes dummy: yes, Extra-curricular activities dummy: yes.

Step number: 1

Observed Groups and Predicted Probabilities

F	R	400 +	P+
		I	PI
		I	PI
		I	PI
		I	PI
		I	PI
		300 +	P+

[illegible]

Page 69

Binary Logistic Regression Prediction Diagnostics
Saved predicted probability and residual checks

Frequencies

Statistics						
		Predicted probability	Predicted group	Analog of Cook's influence statistics	Leverage value	Standard residual
N	Valid	649	649	649	649	649
	Missing	0	0	0	0	0
Mean		.8459168	.86	.0368102	.0308166	.0341677
Std. Deviation		.30222768	.344	.13744180	.05804639	.54147745
Minimum		.00000	0	.00000	.00000	-3.87821
Maximum		1.00000	1	1.35004	.51168	2.21340

Explore

Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass

Case Processing Summary

		Cases			
		Valid		Missing	
		N	Percent	N	Percent
Predicted probability	Not pass: G3 < 10	100	100.0%	0	0.0%
	Pass: G3 >= 10	549	100.0%	0	0.0%
Standard residual	Not pass: G3 < 10	100	100.0%	0	0.0%
	Pass: G3 >= 10	549	100.0%	0	0.0%

Case Processing Summary

		Cases	
		Total	
		N	Percent
Predicted probability	Not pass: G3 < 10	100	100.0%
	Pass: G3 >= 10	549	100.0%
Standard residual	Not pass: G3 < 10	100	100.0%
	Pass: G3 >= 10	549	100.0%

Binary Logistic Regression Prediction Diagnostics
Saved predicted probability and residual checks

Descriptives

Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass		Statistic	
Predicted probability	Not pass: G3 < 10	Mean	.2540762
		95% Confidence Interval for Mean	Lower Bound
			.1962057
			Upper Bound
			.3119468
		5% Trimmed Mean	.2317186
		Median	.1115824
		Variance	.085
		Std. Deviation	.29165449
		Minimum	.00000
		Maximum	.99945
		Range	.99945
		Interquartile Range	.48146
		Skewness	.976
		Kurtosis	-.415
	Pass: G3 >= 10	Mean	.9537202
		95% Confidence Interval for Mean	Lower Bound
			.9427635
			Upper Bound
			.9646769
		5% Trimmed Mean	.9789604
		Median	.9996281
		Variance	.017
		Std. Deviation	.13069439
		Minimum	.12332
		Maximum	1.00000
		Range	.87668
		Interquartile Range	.01188
		Skewness	-3.901
		Kurtosis	16.172
Standard residual	Not pass: G3 < 10	Mean	-.7528979
		95% Confidence Interval for Mean	Lower Bound
			-.8959072
			Upper Bound
			-.6098885
		5% Trimmed Mean	-.6954604
		Median	-.5040294
		Variance	.519

Binary Logistic Regression Prediction Diagnostics
Saved predicted probability and residual checks

Descriptives

Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass			Std. Error
Predicted probability	Not pass: G3 < 10	Mean	.02916545
		95% Confidence Interval for Mean	Lower Bound
			Upper Bound
		5% Trimmed Mean	
		Median	
		Variance	
		Std. Deviation	
		Minimum	
		Maximum	
		Range	
		Interquartile Range	
		Skewness	.241
		Kurtosis	.478
	Pass: G3 >= 10	Mean	.00557790
		95% Confidence Interval for Mean	Lower Bound
			Upper Bound
		5% Trimmed Mean	
		Median	
		Variance	
		Std. Deviation	
		Minimum	
		Maximum	
		Range	
		Interquartile Range	
		Skewness	.104
		Kurtosis	.208
Standard residual	Not pass: G3 < 10	Mean	.07207345
		95% Confidence Interval for Mean	Lower Bound
			Upper Bound
		5% Trimmed Mean	
		Median	
		Variance	

Binary Logistic Regression Prediction Diagnostics
 Saved predicted probability and residual checks

Descriptives

Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass		Statistic
	Std. Deviation	.72073446
	Minimum	-3.87821
	Maximum	-.00014
	Range	3.87807
	Interquartile Range	1.07573
	Skewness	-1.303
	Kurtosis	2.263
	Mean	.1775312
	95% Confidence Interval for Mean	Lower Bound
		Upper Bound
	5% Trimmed Mean	.1188577
	Median	.0272801
	Variance	.119
	Std. Deviation	.34528884
Pass: G3 >= 10	Minimum	.00001
	Maximum	2.21340
	Range	2.21340
	Interquartile Range	.15154
	Skewness	3.016
	Kurtosis	9.871

Binary Logistic Regression Prediction Diagnostics
 Saved predicted probability and residual checks

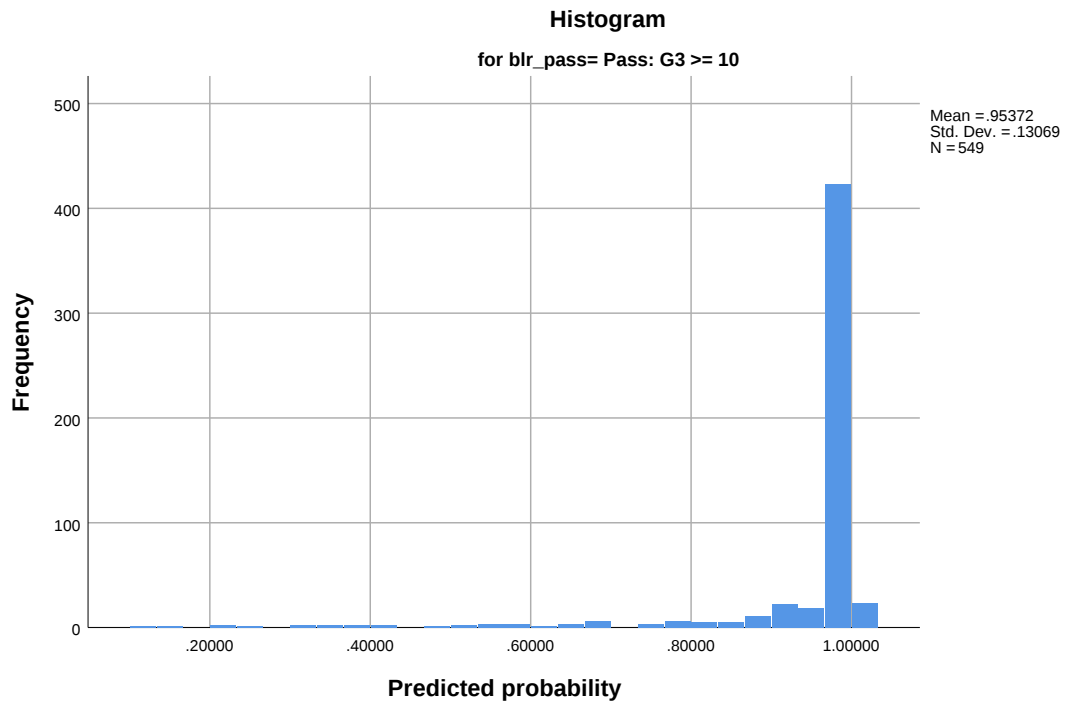
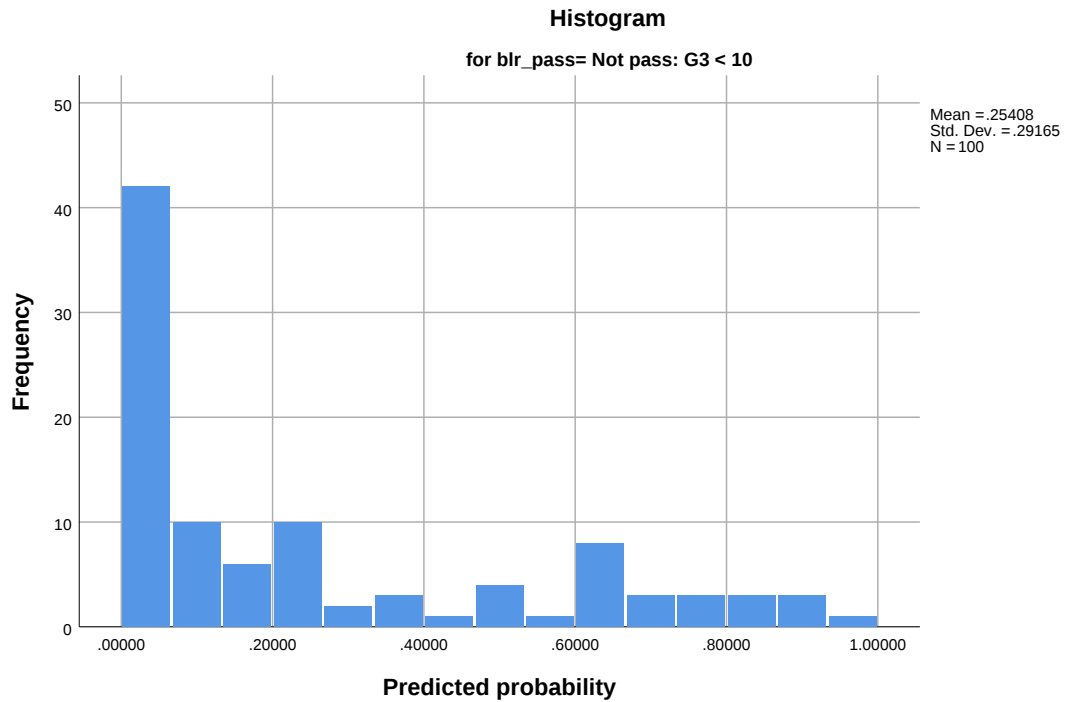
Descriptives

Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass		Std. Error
	Std. Deviation	
	Minimum	
	Maximum	
	Range	
	Interquartile Range	
	Skewness	.241
	Kurtosis	.478
	Mean	.01473657
	95% Confidence Interval for Mean	Lower Bound
		Upper Bound
	5% Trimmed Mean	
	Median	
	Variance	
	Std. Deviation	
Pass: G3 >= 10	Minimum	
	Maximum	
	Range	
	Interquartile Range	
	Skewness	.104
	Kurtosis	.208

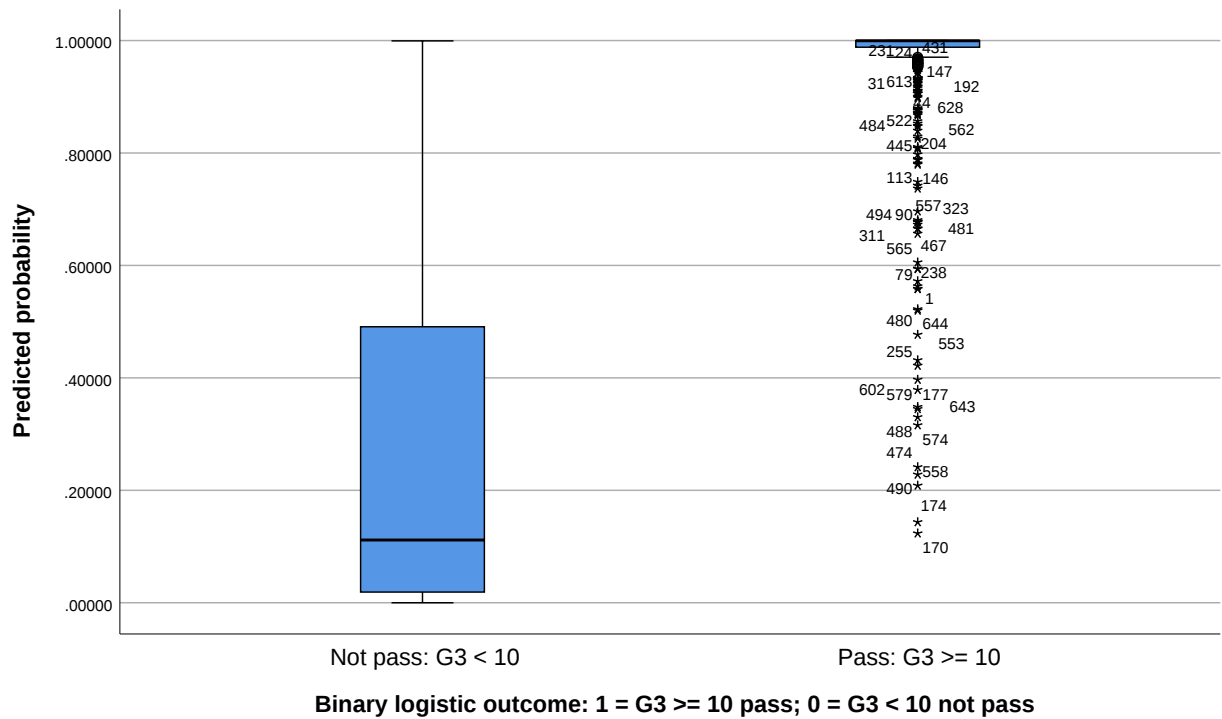
Predicted probability

Histograms

Binary Logistic Regression Prediction Diagnostics
Saved predicted probability and residual checks



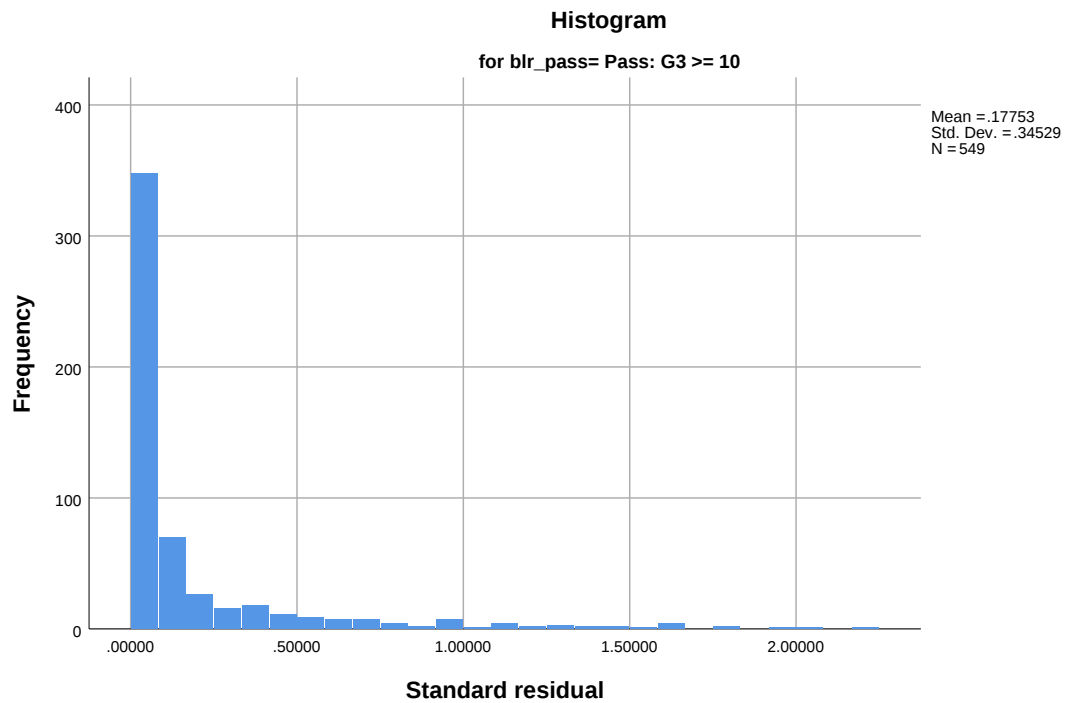
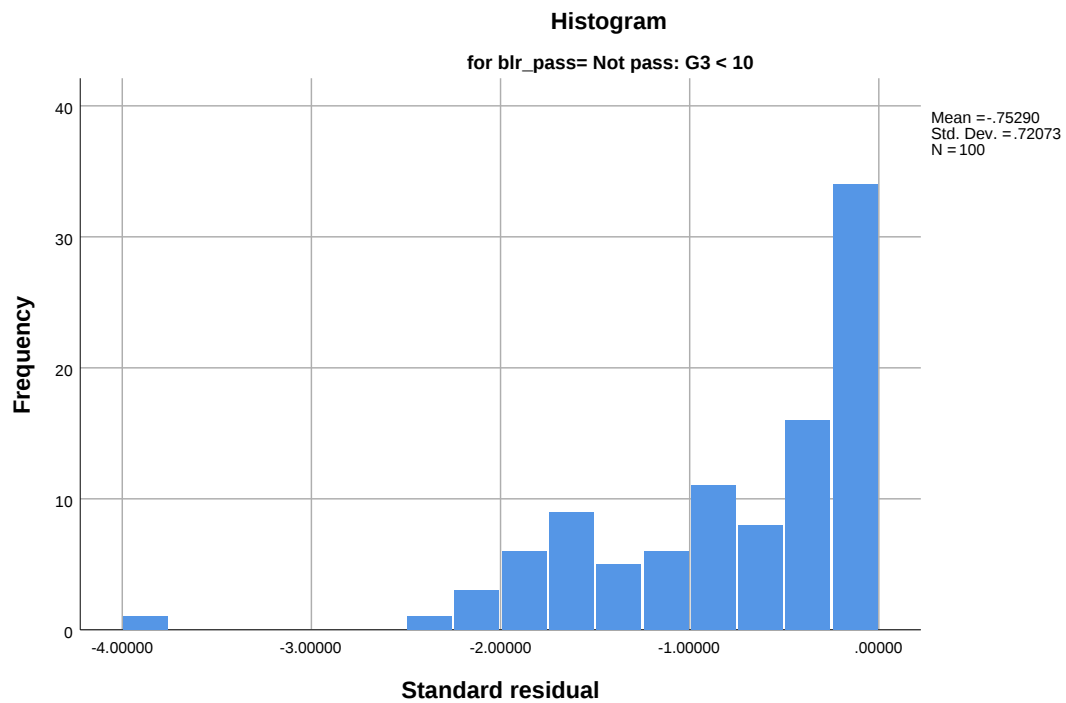
Binary Logistic Regression Prediction Diagnostics Saved predicted probability and residual checks



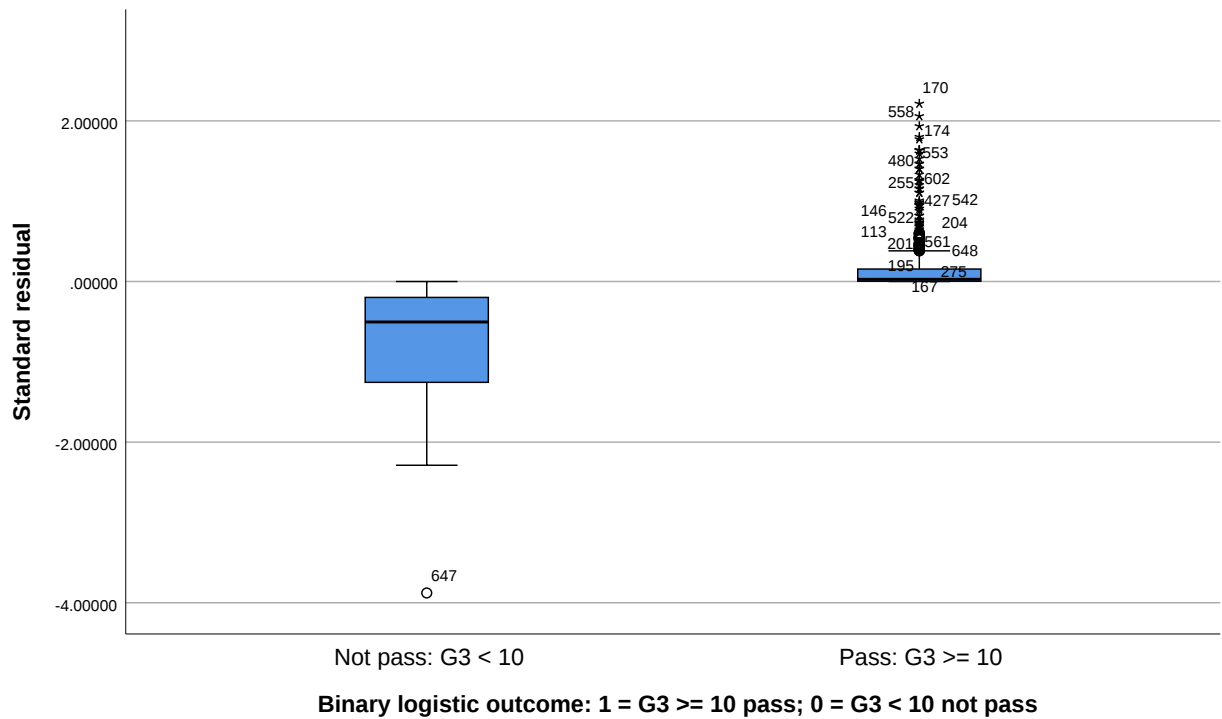
Standard residual

Histograms

Binary Logistic Regression Prediction Diagnostics
Saved predicted probability and residual checks



Binary Logistic Regression Prediction Diagnostics Saved predicted probability and residual checks



Crosstabs

Case Processing Summary

	Valid		Cases Missing		Total	
	N	Percent	N	Percent	N	Percent
Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass * Predicted group	649	100.0%	0	0.0%	649	100.0%

Binary Logistic Regression Prediction Diagnostics
 Saved predicted probability and residual checks

Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass * Predicted group
Crosstabulation

		Predicted group	
		Not pass: G3 < 10	
Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	Not pass: G3 < 10	Count	75
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	75.0%
		% within Predicted group	84.3%
	Pass: G3 >= 10	Count	14
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	2.6%
		% within Predicted group	15.7%
Total		Count	89
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	13.7%
		% within Predicted group	100.0%

Binary Logistic Regression Prediction Diagnostics
Saved predicted probability and residual checks

**Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass * Predicted group
Crosstabulation**

			Predicted group	
			Pass: G3 >= 10	Total
Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	Not pass: G3 < 10	Count	25	100
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	25.0%	100.0%
		% within Predicted group	4.5%	15.4%
	Pass: G3 >= 10	Count	535	549
		% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	97.4%	100.0%
		% within Predicted group	95.5%	84.6%
Total	Count		560	649
	% within Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass		86.3%	100.0%
	% within Predicted group		100.0%	100.0%

Binary Logistic Regression ROC Curve

Binary Logistic Regression ROC Curve
Discrimination of predicted probabilities

ROC Curve

Case Processing Summary

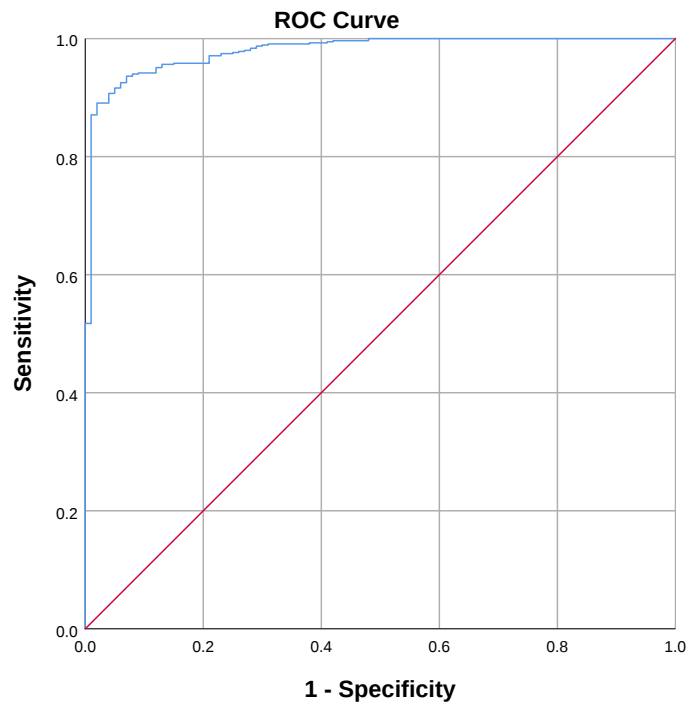
Binary logistic outcome: 1 =
G3 >= 10 pass; 0 = G3 < 10
not pass

Valid N
(listwise)

Positive ^a	549
Negative	100

Larger values of the test result variable(s)
indicate stronger evidence for a positive
actual state.

a. The positive actual state is Pass: G3 >= 10.



Binary Logistic Regression ROC Curve
Discrimination of predicted probabilities

Area Under the Curve

Test Result Variable(s): Predicted probability

Area	Std. Error ^a	Asymptotic Sig. ^b	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
.979	.006	.000	.967	.991

a. Under the nonparametric assumption

b. Null hypothesis: true area = 0.5

Coordinates of the Curve

Test Result Variable(s): Predicted probability

Positive if Greater Than or Equal To ^a	Sensitivity	1 - Specificity
.0000000	1.000	1.000
.0000001	1.000	.990
.0000002	1.000	.980
.0000002	1.000	.970
.0000003	1.000	.960
.0000010	1.000	.950
.0000036	1.000	.940
.0001253	1.000	.930
.0003338	1.000	.920
.0004576	1.000	.910
.0011035	1.000	.900
.0020598	1.000	.890
.0024298	1.000	.880
.0024765	1.000	.870
.0026920	1.000	.860
.0032639	1.000	.850
.0046435	1.000	.840
.0058897	1.000	.830
.0069535	1.000	.820
.0087493	1.000	.810

Binary Logistic Regression ROC Curve
Discrimination of predicted probabilities

Coordinates of the Curve

Test Result Variable(s): Predicted probability

Positive if Greater Than or Equal To ^a	Sensitivity	1 - Specificity
.0099455	1.000	.800
.0101865	1.000	.790
.0109695	1.000	.780
.0134859	1.000	.770
.0167545	1.000	.760
.0189833	1.000	.750
.0200757	1.000	.740
.0205130	1.000	.730
.0213370	1.000	.720
.0221816	1.000	.710
.0233296	1.000	.700
.0256102	1.000	.690
.0275791	1.000	.680
.0290830	1.000	.670
.0303320	1.000	.660
.0341971	1.000	.650
.0377568	1.000	.640
.0386819	1.000	.630
.0421487	1.000	.620
.0451709	1.000	.610
.0464582	1.000	.600
.0496667	1.000	.590
.0597339	1.000	.580
.0693702	1.000	.570
.0721147	1.000	.560
.0755769	1.000	.550
.0816552	1.000	.540
.0859860	1.000	.530
.0898928	1.000	.520

Binary Logistic Regression ROC Curve
Discrimination of predicted probabilities

Coordinates of the Curve

Test Result Variable(s): Predicted probability

Positive if Greater Than or Equal To ^a	Sensitivity	1 - Specificity
.1021264	1.000	.510
.1115824	1.000	.500
.1134934	1.000	.490
.1191694	1.000	.480
.1333280	.998	.480
.1481652	.996	.480
.1614706	.996	.470
.1741470	.996	.460
.1816865	.996	.450
.1883960	.996	.440
.1938488	.996	.430
.2021297	.996	.420
.2139053	.995	.420
.2237002	.995	.410
.2292193	.993	.410
.2330345	.993	.400
.2379559	.993	.390
.2407723	.993	.380
.2432231	.991	.380
.2481031	.991	.370
.2517611	.991	.360
.2531226	.991	.350
.2564115	.991	.340
.2612570	.991	.330
.2809121	.991	.320
.3070927	.991	.310
.3202738	.989	.310
.3274683	.989	.300
.3356697	.987	.300

Binary Logistic Regression ROC Curve
Discrimination of predicted probabilities

Coordinates of the Curve

Test Result Variable(s): Predicted probability

Positive if Greater Than or Equal To ^a	Sensitivity	1 - Specificity
.3428996	.987	.290
.3463969	.985	.290
.3513558	.984	.290
.3665431	.984	.280
.3876179	.982	.280
.3977512	.980	.280
.4102233	.980	.270
.4231832	.978	.270
.4281074	.978	.260
.4519847	.976	.260
.4746249	.976	.250
.4929846	.974	.250
.5126192	.974	.240
.5178039	.974	.230
.5208841	.973	.230
.5264829	.971	.230
.5355929	.971	.220
.5492236	.971	.210
.5581899	.969	.210
.5605681	.967	.210
.5674189	.965	.210
.5827844	.964	.210
.5939514	.962	.210
.5998638	.960	.210
.6060339	.958	.210
.6090314	.958	.200
.6161096	.958	.190
.6273168	.958	.180
.6394999	.958	.170

Binary Logistic Regression ROC Curve
Discrimination of predicted probabilities

Coordinates of the Curve

Test Result Variable(s): Predicted probability

Positive if Greater Than or Equal To ^a	Sensitivity	1 - Specificity
.6456934	.958	.160
.6512756	.958	.150
.6589928	.956	.150
.6626768	.956	.140
.6643938	.956	.130
.6654516	.954	.130
.6691242	.953	.130
.6734696	.951	.130
.6755310	.951	.120
.6770272	.949	.120
.6776863	.947	.120
.6792421	.945	.120
.6883775	.944	.120
.7012411	.942	.120
.7162057	.942	.110
.7304957	.942	.100
.7358834	.942	.090
.7373701	.940	.090
.7399216	.940	.080
.7452603	.938	.080
.7520441	.936	.080
.7674267	.936	.070
.7803567	.934	.070
.7844736	.933	.070
.7878193	.931	.070
.7887758	.929	.070
.7934637	.927	.070
.8004989	.925	.070
.8057694	.925	.060

Binary Logistic Regression ROC Curve
Discrimination of predicted probabilities

Coordinates of the Curve

Test Result Variable(s): Predicted probability

Positive if Greater Than or Equal To ^a	Sensitivity	1 - Specificity
.8081091	.923	.060
.8094705	.922	.060
.8181291	.920	.060
.8274233	.918	.060
.8322230	.916	.060
.8373868	.916	.050
.8434466	.914	.050
.8478290	.913	.050
.8503385	.911	.050
.8543836	.909	.050
.8575505	.907	.050
.8627312	.907	.040
.8680155	.905	.040
.8695022	.903	.040
.8709231	.902	.040
.8738006	.900	.040
.8758030	.898	.040
.8763801	.896	.040
.8775361	.894	.040
.8790740	.893	.040
.8829164	.891	.040
.8873109	.891	.030
.8931622	.891	.020
.8988576	.889	.020
.9027327	.887	.020
.9055319	.885	.020
.9058136	.883	.020
.9073621	.882	.020
.9094028	.880	.020

Binary Logistic Regression ROC Curve
Discrimination of predicted probabilities

Coordinates of the Curve

Test Result Variable(s): Predicted probability

Positive if Greater Than or Equal To ^a	Sensitivity	1 - Specificity
.9104971	.878	.020
.9129982	.876	.020
.9162779	.874	.020
.9180145	.872	.020
.9194297	.871	.020
.9215008	.871	.010
.9230167	.869	.010
.9240942	.867	.010
.9263022	.865	.010
.9280937	.863	.010
.9285625	.862	.010
.9292502	.860	.010
.9303342	.858	.010
.9312630	.856	.010
.9319638	.854	.010
.9323253	.852	.010
.9325635	.851	.010
.9327477	.849	.010
.9332033	.847	.010
.9381900	.845	.010
.9431867	.843	.010
.9454388	.842	.010
.9478044	.840	.010
.9493981	.838	.010
.9518165	.836	.010
.9533953	.834	.010
.9543499	.832	.010
.9557600	.831	.010
.9571533	.829	.010

Binary Logistic Regression ROC Curve
Discrimination of predicted probabilities

Coordinates of the Curve

Test Result Variable(s): Predicted probability

Positive if Greater Than or Equal To ^a	Sensitivity	1 - Specificity
.9579154	.827	.010
.9590394	.825	.010
.9601074	.823	.010
.9604813	.821	.010
.9610994	.820	.010
.9628140	.818	.010
.9643367	.816	.010
.9648987	.814	.010
.9660693	.812	.010
.9668712	.811	.010
.9685286	.809	.010
.9702502	.807	.010
.9705441	.805	.010
.9709279	.803	.010
.9723642	.801	.010
.9740756	.800	.010
.9746524	.798	.010
.9748437	.796	.010
.9752548	.794	.010
.9756185	.792	.010
.9757791	.791	.010
.9767293	.789	.010
.9779808	.787	.010
.9783466	.785	.010
.9786396	.783	.010
.9791016	.781	.010
.9794472	.780	.010
.9796929	.778	.010
.9797963	.776	.010

Binary Logistic Regression ROC Curve
Discrimination of predicted probabilities

Coordinates of the Curve

Test Result Variable(s): Predicted probability

Positive if Greater Than or Equal To ^a	Sensitivity	1 - Specificity
.9799016	.774	.010
.9803841	.772	.010
.9816137	.770	.010
.9827384	.769	.010
.9830259	.767	.010
.9834565	.765	.010
.9845847	.763	.010
.9860673	.761	.010
.9872146	.760	.010
.9876161	.758	.010
.9876540	.756	.010
.9877480	.754	.010
.9879651	.752	.010
.9881140	.750	.010
.9881622	.749	.010
.9883027	.747	.010
.9885461	.745	.010
.9886737	.743	.010
.9887567	.741	.010
.9888895	.740	.010
.9890872	.738	.010
.9892573	.736	.010
.9893301	.734	.010
.9895118	.732	.010
.9897082	.730	.010
.9898077	.729	.010
.9900167	.727	.010
.9903308	.725	.010
.9906283	.723	.010

Binary Logistic Regression ROC Curve
Discrimination of predicted probabilities

Coordinates of the Curve

Test Result Variable(s): Predicted probability

Positive if Greater Than or Equal To ^a	Sensitivity	1 - Specificity
.9907956	.721	.010
.9909255	.719	.010
.9911736	.718	.010
.9913870	.716	.010
.9915796	.714	.010
.9917845	.712	.010
.9918995	.710	.010
.9920071	.709	.010
.9922512	.707	.010
.9924225	.705	.010
.9925157	.703	.010
.9926105	.701	.010
.9926431	.699	.010
.9927580	.698	.010
.9928594	.696	.010
.9928875	.694	.010
.9930617	.692	.010
.9932187	.690	.010
.9932456	.689	.010
.9933545	.687	.010
.9936109	.685	.010
.9937893	.683	.010
.9938536	.681	.010
.9939909	.679	.010
.9940840	.678	.010
.9941184	.676	.010
.9942222	.674	.010
.9943045	.672	.010
.9943760	.670	.010

Binary Logistic Regression ROC Curve
Discrimination of predicted probabilities

Coordinates of the Curve

Test Result Variable(s): Predicted probability

Positive if Greater Than or Equal To ^a	Sensitivity	1 - Specificity
.9945613	.668	.010
.9947291	.667	.010
.9947857	.665	.010
.9947978	.663	.010
.9949212	.661	.010
.9951179	.659	.010
.9952586	.658	.010
.9953528	.656	.010
.9955573	.654	.010
.9957522	.652	.010
.9958825	.650	.010
.9960589	.648	.010
.9961467	.647	.010
.9962712	.645	.010
.9963806	.643	.010
.9964185	.641	.010
.9964535	.639	.010
.9964752	.638	.010
.9965038	.636	.010
.9965575	.634	.010
.9966522	.632	.010
.9967375	.630	.010
.9968951	.628	.010
.9971058	.627	.010
.9971920	.625	.010
.9972272	.623	.010
.9973018	.621	.010
.9974309	.619	.010
.9975864	.617	.010

Binary Logistic Regression ROC Curve
Discrimination of predicted probabilities

Coordinates of the Curve

Test Result Variable(s): Predicted probability

Positive if Greater Than or Equal To ^a	Sensitivity	1 - Specificity
.9976637	.616	.010
.9976998	.614	.010
.9977348	.612	.010
.9977539	.610	.010
.9977778	.608	.010
.9978144	.607	.010
.9978408	.605	.010
.9979086	.603	.010
.9980179	.601	.010
.9980999	.599	.010
.9981505	.597	.010
.9981716	.596	.010
.9981947	.594	.010
.9982447	.592	.010
.9982982	.590	.010
.9983419	.588	.010
.9983655	.587	.010
.9983682	.585	.010
.9983862	.583	.010
.9984279	.581	.010
.9984859	.579	.010
.9985220	.577	.010
.9985306	.576	.010
.9985434	.574	.010
.9985685	.572	.010
.9985931	.570	.010
.9986429	.568	.010
.9987411	.566	.010
.9988238	.565	.010

Binary Logistic Regression ROC Curve
Discrimination of predicted probabilities

Coordinates of the Curve

Test Result Variable(s): Predicted probability

Positive if Greater Than or Equal To ^a	Sensitivity	1 - Specificity
.9988775	.563	.010
.9989071	.561	.010
.9989227	.559	.010
.9989588	.557	.010
.9989882	.556	.010
.9990173	.554	.010
.9990542	.552	.010
.9990707	.550	.010
.9990852	.548	.010
.9991123	.546	.010
.9991315	.545	.010
.9991397	.543	.010
.9991488	.541	.010
.9991589	.539	.010
.9991914	.537	.010
.9992385	.536	.010
.9992643	.534	.010
.9992850	.532	.010
.9993003	.530	.010
.9993170	.528	.010
.9993337	.526	.010
.9993621	.525	.010
.9993896	.523	.010
.9993981	.521	.010
.9994208	.519	.010
.9994451	.517	.010
.9994573	.517	.000
.9994810	.515	.000
.9995037	.514	.000

Binary Logistic Regression ROC Curve
Discrimination of predicted probabilities

Coordinates of the Curve

Test Result Variable(s): Predicted probability

Positive if Greater Than or Equal To ^a	Sensitivity	1 - Specificity
.9995183	.512	.000
.9995587	.510	.000
.9995871	.508	.000
.9995898	.506	.000
.9996014	.505	.000
.9996174	.503	.000
.9996257	.501	.000
.9996286	.499	.000
.9996307	.497	.000
.9996370	.495	.000
.9996426	.494	.000
.9996516	.492	.000
.9996625	.490	.000
.9996687	.488	.000
.9996791	.486	.000
.9996866	.485	.000
.9996964	.483	.000
.9997107	.481	.000
.9997158	.479	.000
.9997188	.477	.000
.9997249	.475	.000
.9997317	.474	.000
.9997372	.472	.000
.9997409	.470	.000
.9997429	.468	.000
.9997451	.466	.000
.9997472	.464	.000
.9997515	.463	.000
.9997586	.461	.000

Binary Logistic Regression ROC Curve
Discrimination of predicted probabilities

Coordinates of the Curve

Test Result Variable(s): Predicted probability

Positive if Greater Than or Equal To ^a	Sensitivity	1 - Specificity
.9997670	.459	.000
.9997822	.457	.000
.9997982	.455	.000
.9998043	.454	.000
.9998144	.452	.000
.9998267	.450	.000
.9998303	.448	.000
.9998326	.446	.000
.9998340	.444	.000
.9998352	.443	.000
.9998362	.441	.000
.9998367	.439	.000
.9998379	.437	.000
.9998402	.435	.000
.9998417	.434	.000
.9998426	.432	.000
.9998435	.430	.000
.9998446	.428	.000
.9998513	.426	.000
.9998576	.424	.000
.9998617	.423	.000
.9998657	.421	.000
.9998677	.419	.000
.9998693	.417	.000
.9998710	.415	.000
.9998731	.413	.000
.9998755	.412	.000
.9998783	.410	.000
.9998798	.408	.000

Binary Logistic Regression ROC Curve
Discrimination of predicted probabilities

Coordinates of the Curve

Test Result Variable(s): Predicted probability

Positive if Greater Than or Equal To ^a	Sensitivity	1 - Specificity
.9998821	.406	.000
.9998867	.404	.000
.9998932	.403	.000
.9998982	.401	.000
.9999077	.399	.000
.9999164	.397	.000
.9999169	.395	.000
.9999200	.393	.000
.9999265	.392	.000
.9999302	.390	.000
.9999306	.388	.000
.9999310	.386	.000
.9999339	.384	.000
.9999367	.383	.000
.9999391	.381	.000
.9999420	.379	.000
.9999455	.377	.000
.9999491	.375	.000
.9999510	.373	.000
.9999523	.372	.000
.9999526	.370	.000
.9999528	.368	.000
.9999539	.366	.000
.9999557	.364	.000
.9999566	.362	.000
.9999579	.361	.000
.9999593	.359	.000
.9999598	.357	.000
.9999617	.355	.000

Binary Logistic Regression ROC Curve
Discrimination of predicted probabilities

Coordinates of the Curve

Test Result Variable(s): Predicted probability

Positive if Greater Than or Equal To ^a	Sensitivity	1 - Specificity
.9999646	.353	.000
.9999662	.352	.000
.9999666	.350	.000
.9999666	.348	.000
.9999667	.346	.000
.9999672	.344	.000
.9999684	.342	.000
.9999691	.341	.000
.9999693	.339	.000
.9999703	.337	.000
.9999713	.335	.000
.9999715	.333	.000
.9999719	.332	.000
.9999726	.330	.000
.9999735	.328	.000
.9999742	.326	.000
.9999753	.324	.000
.9999762	.322	.000
.9999765	.321	.000
.9999766	.319	.000
.9999768	.317	.000
.9999773	.315	.000
.9999781	.313	.000
.9999790	.311	.000
.9999794	.310	.000
.9999798	.308	.000
.9999805	.306	.000
.9999812	.304	.000
.9999821	.302	.000

Binary Logistic Regression ROC Curve
Discrimination of predicted probabilities

Coordinates of the Curve

Test Result Variable(s): Predicted probability

Positive if Greater Than or Equal To ^a	Sensitivity	1 - Specificity
.9999829	.301	.000
.9999831	.299	.000
.9999834	.297	.000
.9999838	.295	.000
.9999841	.293	.000
.9999843	.291	.000
.9999844	.290	.000
.9999848	.288	.000
.9999852	.286	.000
.9999853	.284	.000
.9999854	.282	.000
.9999855	.281	.000
.9999859	.279	.000
.9999863	.277	.000
.9999872	.275	.000
.9999885	.273	.000
.9999891	.271	.000
.9999893	.270	.000
.9999897	.268	.000
.9999901	.266	.000
.9999903	.264	.000
.9999904	.262	.000
.9999905	.260	.000
.9999907	.259	.000
.9999909	.257	.000
.9999912	.255	.000
.9999914	.253	.000
.9999919	.251	.000
.9999924	.250	.000

Binary Logistic Regression ROC Curve
Discrimination of predicted probabilities

Coordinates of the Curve

Test Result Variable(s): Predicted probability

Positive if Greater Than or Equal To ^a	Sensitivity	1 - Specificity
.9999925	.248	.000
.9999930	.246	.000
.9999935	.244	.000
.9999940	.242	.000
.9999946	.240	.000
.9999948	.239	.000
.9999951	.237	.000
.9999954	.235	.000
.9999954	.233	.000
.9999955	.231	.000
.9999957	.230	.000
.9999958	.228	.000
.9999958	.226	.000
.9999959	.224	.000
.9999963	.222	.000
.9999968	.220	.000
.9999968	.219	.000
.9999969	.217	.000
.9999972	.215	.000
.9999976	.213	.000
.9999977	.211	.000
.9999977	.209	.000
.9999978	.208	.000
.9999978	.206	.000
.9999979	.204	.000
.9999979	.202	.000
.9999980	.200	.000
.9999980	.199	.000
.9999980	.197	.000

Binary Logistic Regression ROC Curve
Discrimination of predicted probabilities

Coordinates of the Curve

Test Result Variable(s): Predicted probability

Positive if Greater Than or Equal To ^a	Sensitivity	1 - Specificity
.9999982	.195	.000
.9999984	.193	.000
.9999985	.191	.000
.9999986	.189	.000
.9999987	.188	.000
.9999987	.186	.000
.9999988	.184	.000
.9999988	.182	.000
.9999988	.180	.000
.9999988	.179	.000
.9999988	.177	.000
.9999989	.175	.000
.9999990	.173	.000
.9999990	.171	.000
.9999991	.169	.000
.9999991	.168	.000
.9999991	.166	.000
.9999991	.164	.000
.9999992	.162	.000
.9999992	.160	.000
.9999993	.158	.000
.9999993	.157	.000
.9999994	.155	.000
.9999994	.153	.000
.9999994	.151	.000
.9999994	.149	.000
.9999995	.148	.000
.9999995	.146	.000
.9999995	.144	.000

Binary Logistic Regression ROC Curve
Discrimination of predicted probabilities

Coordinates of the Curve

Test Result Variable(s): Predicted probability

Positive if Greater Than or Equal To ^a	Sensitivity	1 - Specificity
.9999995	.142	.000
.9999996	.140	.000
.9999996	.138	.000
.9999996	.137	.000
.9999997	.135	.000
.9999997	.133	.000
.9999997	.131	.000
.9999997	.129	.000
.9999997	.128	.000
.9999997	.126	.000
.9999997	.124	.000
.9999997	.122	.000
.9999998	.120	.000
.9999998	.118	.000
.9999998	.117	.000
.9999998	.115	.000
.9999998	.113	.000
.9999998	.111	.000
.9999999	.109	.000
.9999999	.107	.000
.9999999	.106	.000
.9999999	.104	.000
.9999999	.102	.000
.9999999	.100	.000
.9999999	.098	.000
.9999999	.097	.000
.9999999	.095	.000
.9999999	.093	.000
.9999999	.091	.000

Binary Logistic Regression ROC Curve
Discrimination of predicted probabilities

Coordinates of the Curve

Test Result Variable(s): Predicted probability

Positive if Greater Than or Equal To ^a	Sensitivity	1 - Specificity
.9999999	.089	.000
1.0000000	.087	.000
1.0000000	.086	.000
1.0000000	.084	.000
1.0000000	.082	.000
1.0000000	.080	.000
1.0000000	.078	.000
1.0000000	.077	.000
1.0000000	.075	.000
1.0000000	.073	.000
1.0000000	.071	.000
1.0000000	.069	.000
1.0000000	.067	.000
1.0000000	.066	.000
1.0000000	.064	.000
1.0000000	.062	.000
1.0000000	.060	.000
1.0000000	.058	.000
1.0000000	.056	.000
1.0000000	.055	.000
1.0000000	.053	.000
1.0000000	.051	.000
1.0000000	.049	.000
1.0000000	.047	.000
1.0000000	.046	.000
1.0000000	.044	.000
1.0000000	.042	.000
1.0000000	.040	.000
1.0000000	.038	.000

Binary Logistic Regression ROC Curve
Discrimination of predicted probabilities

Coordinates of the Curve

Test Result Variable(s): Predicted probability

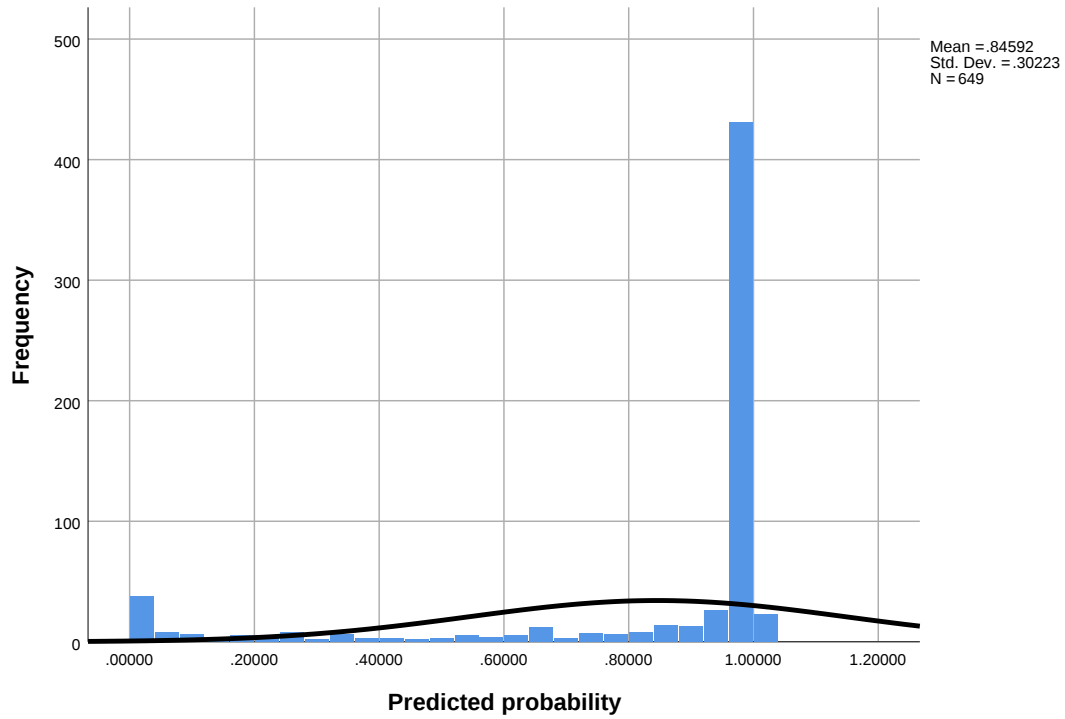
Positive if Greater Than or Equal To ^a	Sensitivity	1 - Specificity
1.0000000	.036	.000
1.0000000	.035	.000
1.0000000	.033	.000
1.0000000	.031	.000
1.0000000	.029	.000
1.0000000	.027	.000
1.0000000	.026	.000
1.0000000	.024	.000
1.0000000	.022	.000
1.0000000	.020	.000
1.0000000	.018	.000
1.0000000	.016	.000
1.0000000	.015	.000
1.0000000	.013	.000
1.0000000	.011	.000
1.0000000	.009	.000
1.0000000	.007	.000
1.0000000	.005	.000
1.0000000	.004	.000
1.0000000	.002	.000
1.0000000	.000	.000

a. The smallest cutoff value is the minimum observed test value minus 1, and the largest cutoff value is the maximum observed test value plus 1. All the other cutoff values are the averages of two consecutive ordered observed test values.

Binary Logistic Regression Predicted Probability Chart

Binary Logistic Regression Predicted Probability Chart
Predicted event probability distribution

Graph



Binary Logistic Regression Sensitivity Model

Binary Logistic Regression Sensitivity Model
Reduced model with strongest grade and risk predictors

Logistic Regression

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
Not pass: G3 < 10	0
Pass: G3 >= 10	1

Block 0: Beginning Block

Classification Table^{a,b}

			Predicted	
			Not pass: G3 < 10	Pass: G3 >= 10
Step 0	Binary logistic outcome: 1 = G3 >= 10 pass; 0 = G3 < 10 not pass	Not pass: G3 < 10	0	100
		Pass: G3 >= 10	0	549
	Overall Percentage			

Binary Logistic Regression Sensitivity Model
Reduced model with strongest grade and risk predictors

Classification Table^{a,b}

Observed		Predicted
		Percentage Correct
Step 0	Binary logistic outcome: 1 = Not pass: G3 < 10	.0
	G3 >= 10 pass; 0 = G3 < 10 not pass	100.0
	Pass: G3 >= 10	
Overall Percentage		84.6

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	1.703	.109	245.313	1	.000	5.490

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	First period grade	205.764	1	.000
		Second period grade	227.644	1	.000
		Weekly study time group	17.693	1	.000
		Number of past class failures	93.833	1	.000
		School absences	4.967	1	.026
		Student age	7.956	1	.005
		School dummy: 1 = MS, 0 = GP	57.331	1	.000
		Sex dummy: 1 = male, 0 = female	3.971	1	.046
		Address dummy: 1 = urban, 0 = rural	10.412	1	.001
		Higher education intention dummy: yes	62.251	1	.000
		Internet access dummy: yes	5.050	1	.025

Binary Logistic Regression Sensitivity Model
Reduced model with strongest grade and risk predictors

Variables not in the Equation

	Score	df	Sig.
Overall Statistics	267.108	11	.000

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	385.408	11	.000
	Block	385.408	11	.000
	Model	385.408	11	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	172.378 ^a	.448	.777

a. Estimation terminated at iteration number 9 because parameter estimates changed by less than .001.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	18.097	8	.021

Binary Logistic Regression Sensitivity Model
Reduced model with strongest grade and risk predictors

Contingency Table for Hosmer and Lemeshow Test

		Binary logistic outcome: 1 = G3 ≥ 10 pass; 0 = G3 < 10 not pass = Not pass: G3 < 10		Binary logistic outcome: 1 = G3 ≥ 10 pass; 0 = G3 < 10 not pass = Pass: G3 ≥ 10		Total
		Observed	Expected	Observed	Expected	
Step 1	1	61	60.459	4	4.541	65
	2	30	30.324	35	34.676	65
	3	8	7.450	57	57.550	65
	4	0	1.383	65	63.617	65
	5	0	.315	65	64.685	65
	6	1	.055	64	64.945	65
	7	0	.011	65	64.989	65
	8	0	.002	65	64.998	65
	9	0	.000	65	65.000	65
	10	0	.000	64	64.000	64

Classification Table^a

		Predicted	
		Binary logistic outcome: 1 = G3 ≥ 10 pass; 0 = G3 < 10 not pass	
		Not pass: G3 < 10	Pass: G3 ≥ 10
Observed			
Step 1	Binary logistic outcome: 1 = G3 ≥ 10 pass; 0 = G3 < 10 not pass	Not pass: G3 < 10	76
		Pass: G3 ≥ 10	24
Overall Percentage		17	532

Classification Table^a

		Predicted
		Percentage Correct
Observed		
Step 1	Binary logistic outcome: 1 = G3 ≥ 10 pass; 0 = G3 < 10 not pass	Not pass: G3 < 10
		Pass: G3 ≥ 10
Overall Percentage		76.0
		96.9
		93.7

Binary Logistic Regression Sensitivity Model
Reduced model with strongest grade and risk predictors

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.
Step 1 ^a	First period grade	.650	.144	20.308	1	.000
	Second period grade	1.532	.231	44.085	1	.000
	Weekly study time group	.091	.275	.111	1	.739
	Number of past class failures	-.312	.255	1.503	1	.220
	School absences	-.047	.045	1.103	1	.294
	Student age	.548	.195	7.915	1	.005
	School dummy: 1 = MS, 0 = GP	-1.068	.449	5.651	1	.017
	Sex dummy: 1 = male, 0 = female	-.670	.428	2.450	1	.118
	Address dummy: 1 = urban, 0 = rural	-.098	.415	.056	1	.814
	Higher education intention dummy: yes	.788	.492	2.570	1	.109
	Internet access dummy: yes	-.401	.454	.781	1	.377
	Constant	-27.470	4.608	35.538	1	.000

Binary Logistic Regression Sensitivity Model
Reduced model with strongest grade and risk predictors

Variables in the Equation

		Exp(B)	95% C.I.for EXP(B)	
			Lower	Upper
Step 1 ^a	First period grade	1.916	1.444	2.541
	Second period grade	4.628	2.944	7.276
	Weekly study time group	1.096	.639	1.878
	Number of past class failures	.732	.444	1.206
	School absences	.954	.875	1.041
	Student age	1.730	1.181	2.534
	School dummy: 1 = MS, 0 = GP	.344	.142	.829
	Sex dummy: 1 = male, 0 = female	.512	.221	1.184
	Address dummy: 1 = urban, 0 = rural	.907	.402	2.044
	Higher education intention dummy: yes	2.200	.839	5.768
	Internet access dummy: yes	.670	.275	1.630
	Constant	.000		

a. Variable(s) entered on step 1: First period grade, Second period grade, Weekly study time group, Number of past class failures, School absences, Student age, School dummy: 1 = MS, 0 = GP, Sex dummy: 1 = male, 0 = female, Address dummy: 1 = urban, 0 = rural, Higher education intention dummy: yes, Internet access dummy: yes.

Step number: 1

Observed Groups and Predicted Probabilities

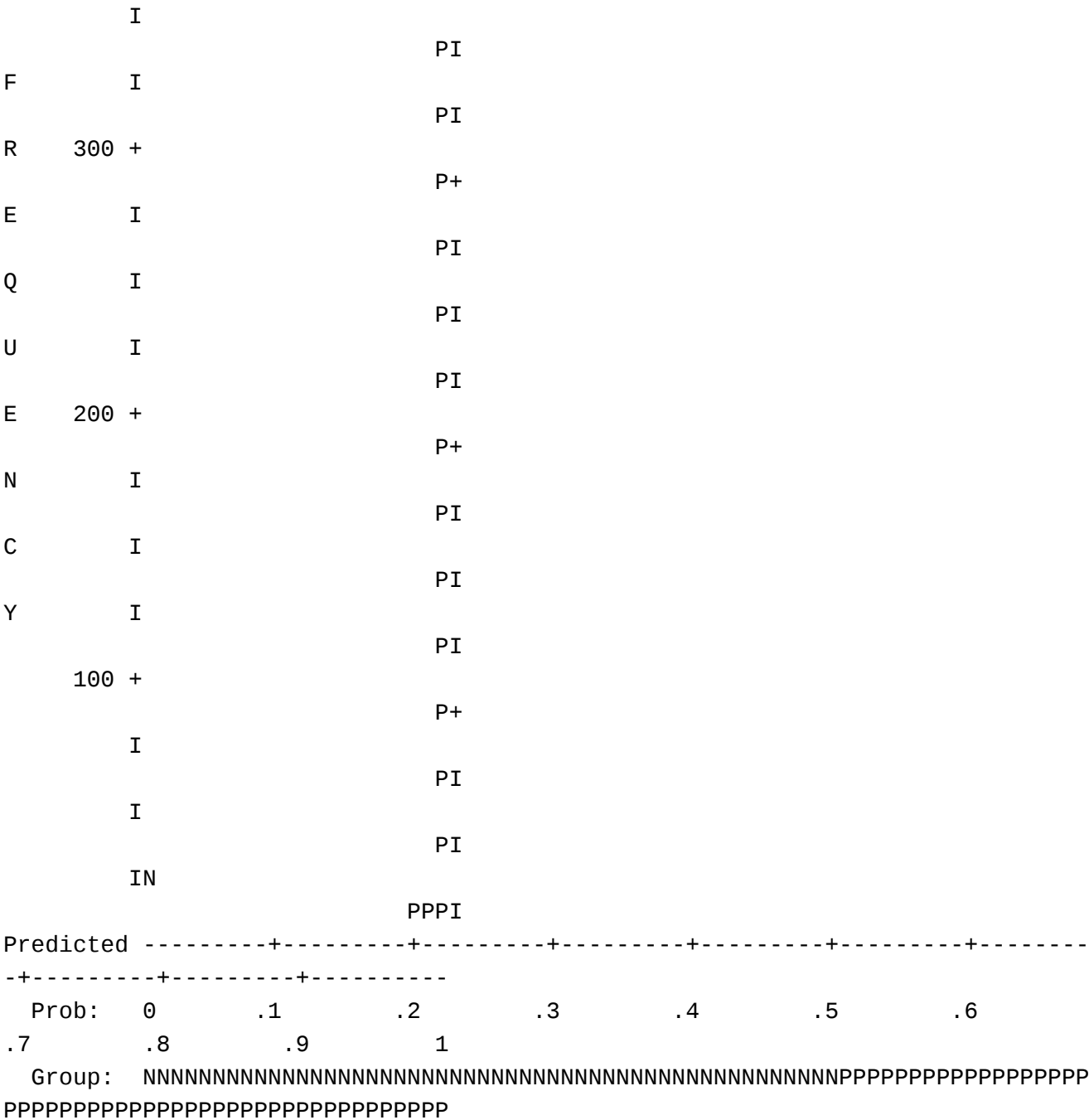
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Binary Logistic Regression Sensitivity Model
 Reduced model with strongest grade and risk predictors



Binary Logistic Regression Sensitivity Model
Reduced model with strongest grade and risk predictors

Each Symbol Represents 25 Cases.