

Host

Notes

Output Created		23-JUN-2026 09:27:23
Comments		
Input	Data	D:\DATA ANALYSIS\E ANOVA Family\Two Way ANOVA\SPSS_Output\sav\two_way_anova_spss_ready_data.sav
	Active Dataset	TwoWayANOVADData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c if not exist "D:\DATA ANALYSIS\E ANOVA Family\Two Way MANOVA\SPSS_Output" mkdir "D:\DATA ANALYSIS\E ANOVA Family\Two Way MANOVA\SPSS_Output"'
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.14

Host

Notes

Output Created		23-JUN-2026 09:27:23
Comments		
Input	Data	D:\DATA ANALYSIS\E ANOVA Family\Two Way ANOVA\SPSS_Output\sav\two_way_anova_spss_ready_data.sav
	Active Dataset	TwoWayANOVADData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c if not exist "D:\DATA ANALYSIS\E ANOVA Family\Two Way MANOVA\SPSS_Output\png" mkdir "D:\DATA ANALYSIS\E ANOVA Family\Two Way MANOVA\SPSS_Output\png"'
Resources	Processor Time	00:00:00.03
	Elapsed Time	00:00:00.09

Host

Notes

Output Created		23-JUN-2026 09:27:23
Comments		
Input	Data	D:\DATA ANALYSIS\E ANOVA Family\Two Way ANOVA\SPSS_Output\sav\two_way_anova_spss_ready_data.sav
	Active Dataset	TwoWayANOVADData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c if not exist "D:\DATA ANALYSIS\E ANOVA Family\Two Way MANOVA\SPSS_Output\c sv" mkdir "D:\DATA ANALYSIS\E ANOVA Family\Two Way MANOVA\SPSS_Output\c sv"'.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.10

Host

Notes

Output Created		23-JUN-2026 09:27:23
Comments		
Input	Data	D:\DATA ANALYSIS\E ANOVA Family\Two Way ANOVA\SPSS_Output\sav\two_way_anova_spss_ready_data.sav
	Active Dataset	TwoWayANOVADData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c if not exist "D:\DATA ANALYSIS\E ANOVA Family\Two Way MANOVA\SPSS_Output\txt" mkdir "D:\DATA ANALYSIS\E ANOVA Family\Two Way MANOVA\SPSS_Output\txt"'
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.09

Host

Notes

Output Created		23-JUN-2026 09:27:23
Comments		
Input	Data	D:\DATA ANALYSIS\E ANOVA Family\Two Way ANOVA\SPSS_Output\sav\two_way_anova_spss_ready_data.sav
	Active Dataset	TwoWayANOVADData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c if not exist "D:\DATA ANALYSIS\E ANOVA Family\Two Way MANOVA\SPSS_Output\pdf" mkdir "D:\DATA ANALYSIS\E ANOVA Family\Two Way MANOVA\SPSS_Output\pdf"'
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.09

Host

Notes

Output Created		23-JUN-2026 09:27:23
Comments		
Input	Data	D:\DATA ANALYSIS\E ANOVA Family\Two Way ANOVA\SPSS_Output\sav\two_way_anova_spss_ready_data.sav
	Active Dataset	TwoWayANOVAData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c if not exist "D:\DATA ANALYSIS\E ANOVA Family\Two Way MANOVA\SPSS_Output\spv" mkdir "D:\DATA ANALYSIS\E ANOVA Family\Two Way MANOVA\SPSS_Output\spv"'
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.09

Host

Notes

Output Created		23-JUN-2026 09:27:24
Comments		
Input	Data	D:\DATA ANALYSIS\E ANOVA Family\Two Way ANOVA\SPSS_Output\sav\two_way_anova_spss_ready_data.sav
	Active Dataset	TwoWayANOVADData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c if not exist "D:\DATA ANALYSIS\E ANOVA Family\Two Way MANOVA\SPSS_Output\sav" mkdir "D:\DATA ANALYSIS\E ANOVA Family\Two Way MANOVA\SPSS_Output\sav"'.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.10

Host

Notes

Output Created		23-JUN-2026 09:27:24
Comments		
Input	Data	D:\DATA ANALYSIS\E ANOVA Family\Two Way ANOVA\SPSS_Output\sav\two_way_anova_spss_ready_data.sav
	Active Dataset	TwoWayANOVADData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c del /q "D:\DATA ANALYSIS\E ANOVA Family\Two Way MANOVA\SPSS_Output\png*.png" 2>nul'.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.09

Host

Notes

Output Created		23-JUN-2026 09:27:24
Comments		
Input	Data	D:\DATA ANALYSIS\E ANOVA Family\Two Way ANOVA\SPSS_Output\sav\two_way_anova_spss_ready_data.sav
	Active Dataset	TwoWayANOVADData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c del /q "D:\DATA ANALYSIS\E ANOVA Family\Two Way MANOVA\SPSS_Output\csv*.csv" 2>nul'.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.10

Host

Notes

Output Created		23-JUN-2026 09:27:24
Comments		
Input	Data	D:\DATA ANALYSIS\E ANOVA Family\Two Way ANOVA\SPSS_Output\sav\two_way_anova_spss_ready_data.sav
	Active Dataset	TwoWayANOVAData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c del /q "D:\DATA ANALYSIS\E ANOVA Family\Two Way MANOVA\SPSS_Output\txt*.txt" 2>nul'.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.09

Host

Notes

Output Created		23-JUN-2026 09:27:24
Comments		
Input	Data	D:\DATA ANALYSIS\E ANOVA Family\Two Way ANOVA\SPSS_Output\sav\two_way_anova_spss_ready_data.sav
	Active Dataset	TwoWayANOVADData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c del /q "D:\DATA ANALYSIS\E ANOVA Family\Two Way MANOVA\SPSS_Output\pdf*.pdf" 2>nul'.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.09

Host

Notes

Output Created		23-JUN-2026 09:27:24
Comments		
Input	Data	D:\DATA ANALYSIS\E ANOVA Family\Two Way ANOVA\SPSS_Output\sav\two_way_anova_spss_ready_data.sav
	Active Dataset	TwoWayANOVADData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c del /q "D:\DATA ANALYSIS\E ANOVA Family\Two Way MANOVA\SPSS_Output\spv*.spv" 2>nul'.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.10

Host

Notes

Output Created		23-JUN-2026 09:27:24
Comments		
Input	Data	D:\DATA ANALYSIS\E ANOVA Family\Two Way ANOVA\SPSS_Output\sav\two_way_anova_spss_ready_data.sav
	Active Dataset	TwoWayANOVADData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND='cmd /c del /q "D:\DATA ANALYSIS\E ANOVA Family\Two Way MANOVA\SPSS_Output\sav*.sav" 2>nul'.
Resources	Processor Time	00:00:00.03
	Elapsed Time	00:00:00.10

Two Way MANOVA: G1, G2, and G3 by School and Studytime

```
>Warning # 2004.  Command name: SUBTITLE  
>The subtitle given exceeds 60 characters in length.  The first 60 characters  
>will be used.
```

Two Way MANOVA: G1, G2, and G3 by School and Studytime
 SPSS GLM prints multivariate tests and partial eta squared f

Means

Notes

Output Created		23-JUN-2026 09:27:25
Comments		
Input	Data	D:\DATA ANALYSIS\E ANOVA Family\Two Way MANOVA\SPSS_Output\sav\two_way_manova_spss_ready_data.sav
	Active Dataset	TwoWayMANOVADData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Missing Value Handling	Definition of Missing	For each dependent variable in a table, user-defined missing values for the dependent and all grouping variables are treated as missing.
	Cases Used	Cases used for each table have no missing values in any independent variable, and not all dependent variables have missing values.
Syntax		MEANS TABLES=G1 G2 G3 BY school_id BY studytime /CELLS=COUNT MEAN STDDEV MIN MAX.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.03

[TwoWayMANOVADData] D:\DATA ANALYSIS\E ANOVA Family\Two Way MANOVA\SPSS_Output\sav\two_way_manova_spss_ready_data.sav

Two Way MANOVA: G1, G2, and G3 by School and Studytime
 SPSS GLM prints multivariate tests and partial eta squared f

Case Processing Summary

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
G1 * school_id * studytime	649	100.0%	0	0.0%	649	100.0%
G2 * school_id * studytime	649	100.0%	0	0.0%	649	100.0%
G3 * school_id * studytime	649	100.0%	0	0.0%	649	100.0%

Report

school_id	studytime	G1	G2	G3	
1	1	N	119	119	119
		Mean	11.1681	11.2689	11.5294
		Std. Deviation	2.36972	2.39242	2.75504
		Minimum	7.00	7.00	.00
		Maximum	18.00	18.00	18.00
	2	N	206	206	206
		Mean	12.0631	12.1990	12.7330
		Std. Deviation	2.34591	2.35697	2.45378
		Minimum	.00	6.00	1.00
		Maximum	17.00	18.00	18.00
	3	N	71	71	71
		Mean	12.7042	13.1127	13.5634
		Std. Deviation	2.22579	2.18141	2.24074
		Minimum	7.00	7.00	8.00
		Maximum	18.00	18.00	18.00
	4	N	27	27	27
		Mean	13.1111	13.0370	13.4074
		Std. Deviation	2.62141	2.83497	2.80466
		Minimum	9.00	9.00	10.00
		Maximum	18.00	19.00	19.00
Total	N	423	423	423	
	Mean	11.9858	12.1442	12.5768	

Two Way MANOVA: G1, G2, and G3 by School and Studytime
 SPSS GLM prints multivariate tests and partial eta squared f

Report

school_id	studytime		G1	G2	G3
		Std. Deviation	2.41829	2.45152	2.62564
		Minimum	.00	6.00	.00
		Maximum	18.00	19.00	19.00
2	1	N	93	93	93
		Mean	9.6559	9.9785	9.9677
		Std. Deviation	2.56860	2.89669	3.55531
		Minimum	4.00	.00	.00
		Maximum	17.00	17.00	17.00
	2	N	99	99	99
		Mean	10.4444	10.5455	10.7576
		Std. Deviation	3.15330	3.75601	4.16764
		Minimum	4.00	.00	.00
		Maximum	18.00	18.00	19.00
	3	N	26	26	26
		Mean	11.6538	11.9231	12.3077
		Std. Deviation	2.91125	2.97890	2.96337
		Minimum	7.00	7.00	8.00
		Maximum	19.00	17.00	18.00
	4	N	8	8	8
		Mean	11.6250	11.2500	11.8750
		Std. Deviation	3.81491	3.88219	3.68152
		Minimum	5.00	6.00	6.00
		Maximum	18.00	18.00	18.00
Total	N	226	226	226	
	Mean	10.3009	10.4956	10.6504	
	Std. Deviation	2.97959	3.37606	3.83399	
	Minimum	4.00	.00	.00	
	Maximum	19.00	18.00	19.00	
Total	1	N	212	212	212
		Mean	10.5047	10.7028	10.8443

Two Way MANOVA: G1, G2, and G3 by School and Studytime
 SPSS GLM prints multivariate tests and partial eta squared f

Report

school_id	studytime	G1	G2	G3
	Std. Deviation	2.56572	2.69656	3.21862
	Minimum	4.00	.00	.00
	Maximum	18.00	18.00	18.00
2	N	305	305	305
	Mean	11.5377	11.6623	12.0918
	Std. Deviation	2.73730	2.98252	3.24313
	Minimum	.00	.00	.00
	Maximum	18.00	18.00	19.00
	3	N	97	97
Mean		12.4227	12.7938	13.2268
Std. Deviation		2.45728	2.46195	2.50210
	Minimum	7.00	7.00	8.00
	Maximum	19.00	18.00	18.00
	4	N	35	35
Mean		12.7714	12.6286	13.0571
Std. Deviation		2.94145	3.13506	3.03841
	Minimum	5.00	6.00	6.00
	Maximum	18.00	19.00	19.00
	Total	N	649	649
Mean		11.3991	11.5701	11.9060
Std. Deviation		2.74527	2.91364	3.23066
	Minimum	.00	.00	.00
	Maximum	19.00	19.00	19.00

General Linear Model

Two Way MANOVA: G1, G2, and G3 by School and Studytime
 SPSS GLM prints multivariate tests and partial eta squared f

Notes

Output Created		23-JUN-2026 09:27:25
Comments		
Input	Data	D:\DATA ANALYSIS\IE ANOVA Family\Two Way MANOVA\SPSS_Output\sav\two_way_manova_sps_ready_data.sav
	Active Dataset	TwoWayMANOVAData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the model.
Syntax		GLM G1 G2 G3 BY school_id studytime /METHOD=SSTYPE(3) /INTERCEPT=INCLUDE /PRINT=DESCRIPTIVE ETASQ HOMOGENEITY PARAMETER /CRITERIA=ALPHA(.05) /DESIGN=school_id studytime school_id*studytime.
Resources	Processor Time	00:00:00.08
	Elapsed Time	00:00:00.07

Two Way MANOVA: G1, G2, and G3 by School and Studytime
 SPSS GLM prints multivariate tests and partial eta squared f

Between-Subjects Factors

		Value Label	N
school_id	1	GP	423
	2	MS	226
studytime	1		212
	2		305
	3		97
	4		35

Descriptive Statistics

	school_id	studytime	Mean	Std. Deviation	N
G1	1	1	11.1681	2.36972	119
		2	12.0631	2.34591	206
		3	12.7042	2.22579	71
		4	13.1111	2.62141	27
		Total	11.9858	2.41829	423
	2	1	9.6559	2.56860	93
		2	10.4444	3.15330	99
		3	11.6538	2.91125	26
		4	11.6250	3.81491	8
		Total	10.3009	2.97959	226
	Total	1	10.5047	2.56572	212
		2	11.5377	2.73730	305
		3	12.4227	2.45728	97
		4	12.7714	2.94145	35
Total		11.3991	2.74527	649	
G2	1	1	11.2689	2.39242	119
		2	12.1990	2.35697	206
		3	13.1127	2.18141	71
		4	13.0370	2.83497	27
		Total	12.1442	2.45152	423
	2	1	9.9785	2.89669	93
		2	10.5455	3.75601	99
		3	11.9231	2.97890	26

Two Way MANOVA: G1, G2, and G3 by School and Studytime
 SPSS GLM prints multivariate tests and partial eta squared f

Descriptive Statistics

	school_id	studytime	Mean	Std. Deviation	N
		4	11.2500	3.88219	8
		Total	10.4956	3.37606	226
	Total	1	10.7028	2.69656	212
		2	11.6623	2.98252	305
		3	12.7938	2.46195	97
		4	12.6286	3.13506	35
		Total	11.5701	2.91364	649
G3	1	1	11.5294	2.75504	119
		2	12.7330	2.45378	206
		3	13.5634	2.24074	71
		4	13.4074	2.80466	27
		Total	12.5768	2.62564	423
		2	1	9.9677	3.55531
	2		10.7576	4.16764	99
	3		12.3077	2.96337	26
	4		11.8750	3.68152	8
	Total		10.6504	3.83399	226
	Total	1	10.8443	3.21862	212
		2	12.0918	3.24313	305
		3	13.2268	2.50210	97
		4	13.0571	3.03841	35
		Total	11.9060	3.23066	649

Two Way MANOVA: G1, G2, and G3 by School and Studytime
SPSS GLM prints multivariate tests and partial eta squared f

**Box's Test of
Equality of
Covariance
Matrices^a**

Box's M	209.057
F	4.752
df1	42
df2	11028.598
Sig.	.000

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + school_id + studytime + school_id * studytime

Two Way MANOVA: G1, G2, and G3 by School and Studytime
 SPSS GLM prints multivariate tests and partial eta squared f

Multivariate Tests^a

Effect		Value	F	Hypothesis df	Error df
Intercept	Pillai's Trace	.894	1793.151 ^b	3.000	639.000
	Wilks' Lambda	.106	1793.151 ^b	3.000	639.000
	Hotelling's Trace	8.419	1793.151 ^b	3.000	639.000
	Roy's Largest Root	8.419	1793.151 ^b	3.000	639.000
school_id	Pillai's Trace	.032	6.975 ^b	3.000	639.000
	Wilks' Lambda	.968	6.975 ^b	3.000	639.000
	Hotelling's Trace	.033	6.975 ^b	3.000	639.000
	Roy's Largest Root	.033	6.975 ^b	3.000	639.000
studytime	Pillai's Trace	.064	4.693	9.000	1923.000
	Wilks' Lambda	.936	4.770	9.000	1555.309
	Hotelling's Trace	.068	4.827	9.000	1913.000
	Roy's Largest Root	.062	13.251 ^c	3.000	641.000
school_id * studytime	Pillai's Trace	.006	.404	9.000	1923.000
	Wilks' Lambda	.994	.403	9.000	1555.309
	Hotelling's Trace	.006	.402	9.000	1913.000
	Roy's Largest Root	.003	.727 ^c	3.000	641.000

Two Way MANOVA: G1, G2, and G3 by School and Studytime
 SPSS GLM prints multivariate tests and partial eta squared f

Multivariate Tests^a

Effect		Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.000	.894
	Wilks' Lambda	.000	.894
	Hotelling's Trace	.000	.894
	Roy's Largest Root	.000	.894
school_id	Pillai's Trace	.000	.032
	Wilks' Lambda	.000	.032
	Hotelling's Trace	.000	.032
	Roy's Largest Root	.000	.032
studytime	Pillai's Trace	.000	.021
	Wilks' Lambda	.000	.022
	Hotelling's Trace	.000	.022
	Roy's Largest Root	.000	.058
school_id * studytime	Pillai's Trace	.934	.002
	Wilks' Lambda	.934	.002
	Hotelling's Trace	.935	.002
	Roy's Largest Root	.536	.003

- a. Design: Intercept + school_id + studytime + school_id * studytime
- b. Exact statistic
- c. The statistic is an upper bound on F that yields a lower bound on the significance level.

Two Way MANOVA: G1, G2, and G3 by School and Studytime
 SPSS GLM prints multivariate tests and partial eta squared f

Levene's Test of Equality of Error Variances^a

		Levene Statistic	df1	df2	Sig.
G1	Based on Mean	3.686	7	641	.001
	Based on Median	3.212	7	641	.002
	Based on Median and with adjusted df	3.212	7	607.945	.002
	Based on trimmed mean	3.589	7	641	.001
G2	Based on Mean	4.142	7	641	.000
	Based on Median	3.419	7	641	.001
	Based on Median and with adjusted df	3.419	7	503.797	.001
	Based on trimmed mean	4.274	7	641	.000
G3	Based on Mean	3.420	7	641	.001
	Based on Median	3.304	7	641	.002
	Based on Median and with adjusted df	3.304	7	483.824	.002
	Based on trimmed mean	3.376	7	641	.002

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + school_id + studytime + school_id * studytime

Two Way MANOVA: G1, G2, and G3 by School and Studytime
 SPSS GLM prints multivariate tests and partial eta squared f

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F
Corrected Model	G1	672.172 ^a	7	96.025	14.615
	G2	662.915 ^b	7	94.702	12.547
	G3	897.822 ^c	7	128.260	14.017
Intercept	G1	34349.422	1	34349.422	5228.102
	G2	35013.353	1	35013.353	4638.877
	G3	37166.619	1	37166.619	4061.722
school_id	G1	129.148	1	129.148	19.657
	G2	140.951	1	140.951	18.674
	G3	160.873	1	160.873	17.581
studytime	G1	233.287	3	77.762	11.836
	G2	227.254	3	75.751	10.036
	G3	319.327	3	106.442	11.632
school_id * studytime	G1	4.798	3	1.599	.243
	G2	6.052	3	2.017	.267
	G3	9.982	3	3.327	.364
Error	G1	4211.467	641	6.570	
	G2	4838.145	641	7.548	
	G3	5865.444	641	9.150	
Total	G1	89214.000	649		
	G2	92381.000	649		
	G3	98761.000	649		
Corrected Total	G1	4883.639	648		
	G2	5501.060	648		
	G3	6763.267	648		

Two Way MANOVA: G1, G2, and G3 by School and Studytime
 SPSS GLM prints multivariate tests and partial eta squared f

Tests of Between-Subjects Effects

Source	Dependent Variable	Sig.	Partial Eta Squared
Corrected Model	G1	.000	.138
	G2	.000	.121
	G3	.000	.133
Intercept	G1	.000	.891
	G2	.000	.879
	G3	.000	.864
school_id	G1	.000	.030
	G2	.000	.028
	G3	.000	.027
studytime	G1	.000	.052
	G2	.000	.045
	G3	.000	.052
school_id * studytime	G1	.866	.001
	G2	.849	.001
	G3	.779	.002
Error	G1		
	G2		
	G3		
Total	G1		
	G2		
	G3		
Corrected Total	G1		
	G2		
	G3		

a. R Squared = .138 (Adjusted R Squared = .128)

b. R Squared = .121 (Adjusted R Squared = .111)

c. R Squared = .133 (Adjusted R Squared = .123)

Two Way MANOVA: G1, G2, and G3 by School and Studytime
 SPSS GLM prints multivariate tests and partial eta squared f

Parameter Estimates

Dependent Variable	Parameter	B	Std. Error	t	Sig.
G1	Intercept	11.625	.906	12.828	.000
	[school_id=1]	1.486	1.032	1.440	.150
	[school_id=2]	0 ^a	.	.	.
	[studytime=1]	-1.969	.944	-2.085	.037
	[studytime=2]	-1.181	.942	-1.253	.211
	[studytime=3]	.029	1.036	.028	.978
	[studytime=4]	0 ^a	.	.	.
	[school_id=1] *	.026	1.091	.024	.981
	[studytime=1]				
	[school_id=1] *	.133	1.078	.123	.902
	[studytime=2]				
	[school_id=1] *	-.436	1.187	-.367	.714
	[studytime=3]				
	[school_id=1] *	0 ^a	.	.	.
	[studytime=4]				
[school_id=2] *	0 ^a	.	.	.	
[studytime=1]					
[school_id=2] *	0 ^a	.	.	.	
[studytime=2]					
[school_id=2] *	0 ^a	.	.	.	
[studytime=3]					
[school_id=2] *	0 ^a	.	.	.	
[studytime=4]					
G2	Intercept	11.250	.971	11.582	.000
	[school_id=1]	1.787	1.106	1.616	.107
	[school_id=2]	0 ^a	.	.	.
	[studytime=1]	-1.272	1.012	-1.256	.210
	[studytime=2]	-.705	1.010	-.698	.486
	[studytime=3]	.673	1.111	.606	.545
	[studytime=4]	0 ^a	.	.	.
	[school_id=1] *	-.497	1.169	-.425	.671
	[studytime=1]				
[school_id=1] *	-.133	1.156	-.115	.908	
[studytime=2]					

Two Way MANOVA: G1, G2, and G3 by School and Studytime
 SPSS GLM prints multivariate tests and partial eta squared f

Parameter Estimates

Dependent Variable	Parameter	95% Confidence Interval		Partial Eta Squared
		Lower Bound	Upper Bound	
G1	Intercept	9.845	13.405	.204
	[school_id=1]	-.540	3.512	.003
	[school_id=2]	.	.	.
	[studytime=1]	-3.824	-.115	.007
	[studytime=2]	-3.031	.670	.002
	[studytime=3]	-2.006	2.064	.000
	[studytime=4]	.	.	.
	[school_id=1] *	-2.116	2.169	.000
	[studytime=1]			
	[school_id=1] *	-1.985	2.250	.000
	[studytime=2]			
	[school_id=1] *	-2.767	1.896	.000
	[studytime=3]			
	[school_id=1] *	.	.	.
	[studytime=4]			
[school_id=2] *	.	.	.	
[studytime=1]				
[school_id=2] *	.	.	.	
[studytime=2]				
[school_id=2] *	.	.	.	
[studytime=3]				
[school_id=2] *	.	.	.	
[studytime=4]				
G2	Intercept	9.343	13.157	.173
	[school_id=1]	-.385	3.959	.004
	[school_id=2]	.	.	.
	[studytime=1]	-3.259	.716	.002
	[studytime=2]	-2.687	1.278	.001
	[studytime=3]	-1.508	2.854	.001
	[studytime=4]	.	.	.
	[school_id=1] *	-2.793	1.800	.000
	[studytime=1]			
	[school_id=1] *	-2.403	2.136	.000
[studytime=2]				

Two Way MANOVA: G1, G2, and G3 by School and Studytime
 SPSS GLM prints multivariate tests and partial eta squared f

Parameter Estimates

Dependent Variable	Parameter	B	Std. Error	t	Sig.
	[school_id=1] * [studytime=3]	-.597	1.273	-.469	.639
	[school_id=1] * [studytime=4]	0 ^a	.	.	.
	[school_id=2] * [studytime=1]	0 ^a	.	.	.
	[school_id=2] * [studytime=2]	0 ^a	.	.	.
	[school_id=2] * [studytime=3]	0 ^a	.	.	.
	[school_id=2] * [studytime=4]	0 ^a	.	.	.
G3	Intercept	11.875	1.069	11.103	.000
	[school_id=1]	1.532	1.218	1.258	.209
	[school_id=2]	0 ^a	.	.	.
	[studytime=1]	-1.907	1.115	-1.711	.088
	[studytime=2]	-1.117	1.112	-1.005	.315
	[studytime=3]	.433	1.223	.354	.724
	[studytime=4]	0 ^a	.	.	.
	[school_id=1] * [studytime=1]	.029	1.288	.023	.982
	[school_id=1] * [studytime=2]	.443	1.273	.348	.728
	[school_id=1] * [studytime=3]	-.277	1.401	-.197	.844
	[school_id=1] * [studytime=4]	0 ^a	.	.	.
	[school_id=2] * [studytime=1]	0 ^a	.	.	.
	[school_id=2] * [studytime=2]	0 ^a	.	.	.
	[school_id=2] * [studytime=3]	0 ^a	.	.	.
	[school_id=2] * [studytime=4]	0 ^a	.	.	.

Two Way MANOVA: G1, G2, and G3 by School and Studytime
 SPSS GLM prints multivariate tests and partial eta squared f

Parameter Estimates

Dependent Variable	Parameter	95% Confidence Interval		Partial Eta Squared
		Lower Bound	Upper Bound	
	[school_id=1] * [studytime=3]	-3.097	1.902	.000
	[school_id=1] * [studytime=4]	.	.	.
	[school_id=2] * [studytime=1]	.	.	.
	[school_id=2] * [studytime=2]	.	.	.
	[school_id=2] * [studytime=3]	.	.	.
	[school_id=2] * [studytime=4]	.	.	.
G3	Intercept	9.775	13.975	.161
	[school_id=1]	-.859	3.924	.002
	[school_id=2]	.	.	.
	[studytime=1]	-4.096	.281	.005
	[studytime=2]	-3.301	1.066	.002
	[studytime=3]	-1.969	2.834	.000
	[studytime=4]	.	.	.
	[school_id=1] * [studytime=1]	-2.499	2.558	.000
	[school_id=1] * [studytime=2]	-2.056	2.942	.000
	[school_id=1] * [studytime=3]	-3.028	2.475	.000
	[school_id=1] * [studytime=4]	.	.	.
	[school_id=2] * [studytime=1]	.	.	.
	[school_id=2] * [studytime=2]	.	.	.
	[school_id=2] * [studytime=3]	.	.	.
	[school_id=2] * [studytime=4]	.	.	.

a. This parameter is set to zero because it is redundant.

Two Way MANOVA: G1, G2, and G3 by School and Studytime
 SPSS GLM prints multivariate tests and partial eta squared f

Graph

Notes

Output Created		23-JUN-2026 09:27:25
Comments		
Input	Data	D:\DATA ANALYSIS\EANOVA Family\Two Way MANOVA\SPSS_Output\save\two_way_manova_sps_ready_data.sav
	Active Dataset	TwoWayMANOVADData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Syntax		GRAPH /LINE(MULTIPLE) =MEAN(G1) MEAN(G2) MEAN(G3) BY studytime BY school_id.
Resources	Processor Time	00:00:00.03
	Elapsed Time	00:00:00.05

```
>Error # 17819 in column 59. Text: BY
>Expected "/" was not found. Perhaps either the "/" between subcommands was
>omitted, or if a chart type was specified, the variable specifications are
>invalid for the requested chart. Skipping to a "/".
>Execution of this command stops.
```

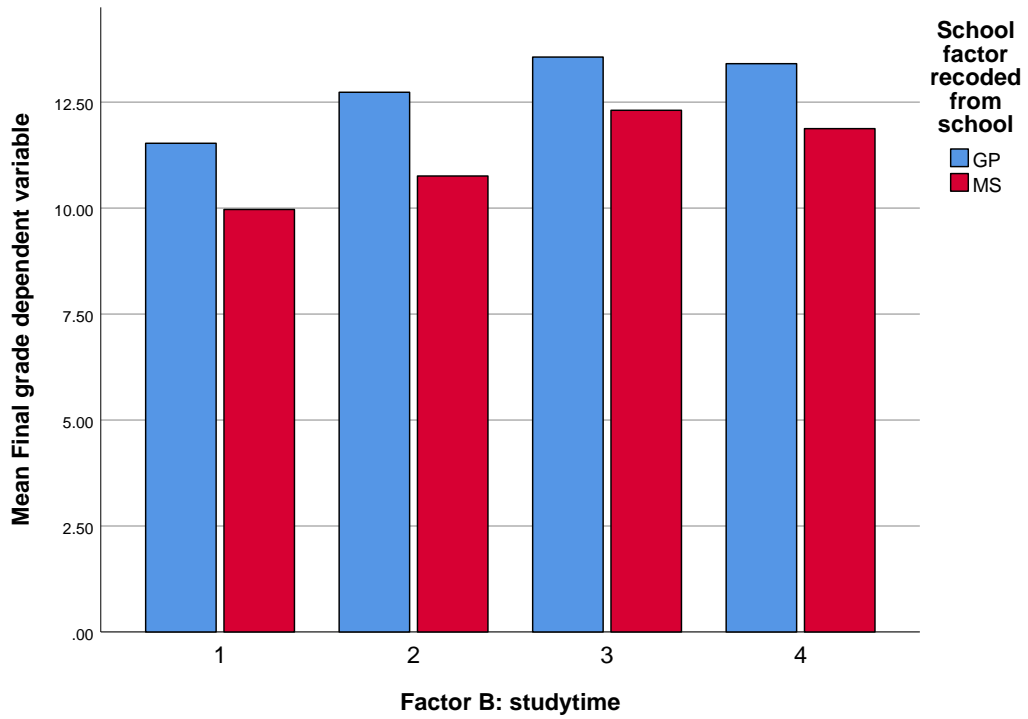
Graph

Two Way MANOVA: G1, G2, and G3 by School and Studytime
 SPSS GLM prints multivariate tests and partial eta squared f

Notes

Output Created		23-JUN-2026 09:27:25
Comments		
Input	Data	D:\DATA ANALYSIS\EANOVA Family\Two Way MANOVA\SPSS_Output\save\two_way_manova_sps_ready_data.sav
	Active Dataset	TwoWayMANOVADData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Syntax		GRAPH /BAR(GROUPED) =MEAN(G3) BY studytime BY school_id.
Resources	Processor Time	00:00:00.55
	Elapsed Time	00:00:00.40

Two Way MANOVA: G1, G2, and G3 by School and Studytime
SPSS GLM prints multivariate tests and partial eta squared f



File "<string>", line 66

```
ax.text(i, v, f"{v:.4g}", ha="center", va="bottom", fontweight="bold")
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^

SyntaxError: invalid syntax