Host

Notes

Output Created		22-JUN-2026 23:33:22
Comments		
Input	Active Dataset	DataSet0
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\E ANOVA Family\Mixed MANOVA\SPSS_Output" mkdir "D:\DATA ANALYSIS\E ANOVA Family\Mixed MANOVA\SPSS_Output"']...
Resources	Processor Time	00:00:00.03
	Elapsed Time	00:00:00.27

Host

Notes

Output Created		22-JUN-2026 23:33:22
Comments		
Input	Active Dataset	DataSet0
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\E ANOVA Family\Mixed MANOVA\SPSS_Output\sav" mkdir "D:\DATA ANALYSIS\E ANOVA Family\Mixed MANOVA\SPSS_Output\sav"'].
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.23

Host

Notes

Output Created		22-JUN-2026 23:33:22
Comments		
Input	Active Dataset	DataSet0
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\E ANOVA Family\Mixed MANOVA\SPSS_Output\spv" mkdir "D:\DATA ANALYSIS\E ANOVA Family\Mixed MANOVA\SPSS_Output\spv"'].
Resources	Processor Time	00:00:00.05
	Elapsed Time	00:00:00.21

Host

Notes

Output Created		22-JUN-2026 23:33:22
Comments		
Input	Active Dataset	DataSet0
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\E ANOVA Family\Mixed MANOVA\SPSS_Output\pdf" mkdir "D:\DATA ANALYSIS\E ANOVA Family\Mixed MANOVA\SPSS_Output\pdf"'].
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.22

Host

Notes

Output Created		22-JUN-2026 23:33:23
Comments		
Input	Active Dataset	DataSet0
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\E ANOVA Family\Mixed MANOVA\SPSS_Output\png" mkdir "D:\DATA ANALYSIS\E ANOVA Family\Mixed MANOVA\SPSS_Output\png"'].
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.19

Host

Notes

Output Created		22-JUN-2026 23:33:23
Comments		
Input	Active Dataset	DataSet0
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\E ANOVA Family\Mixed MANOVA\SPSS_Output\csv" mkdir "D:\DATA ANALYSIS\E ANOVA Family\Mixed MANOVA\SPSS_Output\csv"'].
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.21

Host

Notes

Output Created		22-JUN-2026 23:33:23
Comments		
Input	Active Dataset	DataSet0
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\E ANOVA Family\Mixed MANOVA\SPSS_Output\txt" mkdir "D:\DATA ANALYSIS\E ANOVA Family\Mixed MANOVA\SPSS_Output\txt"'].
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.28

Host

Notes

Output Created		22-JUN-2026 23:33:23
Comments		
Input	Active Dataset	DataSet0
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND=['cmd /c echo SPSS Mixed MANOVA script started > "D:\DATA ANALYSIS\E ANOVA Family\Mixed MANOVA\SPSS_Output\txt\SPSS_SCRIPT_STARTED.txt"'].
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.44

```
sex into sex_num (Student sex)
Old Value   New Value  Value Label

F                   1  F
M                   2  M
```

File Information

Notes

Output Created		22-JUN-2026 23:33:25
Comments		
Input	Data	D:\DATA ANALYSIS\E ANOVA Family\Mixed MANOVA\SPSS_Output\sav\mixed_manova_spss_ready_data.sav
	Active Dataset	MixedMANOVAData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Syntax		DISPLAY DICTIONARY.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01

```
[MixedMANOVAData] D:\DATA ANALYSIS\E ANOVA Family\Mixed MANOVA\SPSS_Output\sav
\mixed_manova_spss_ready_data.sav
```

Variable Information

Variable	Position	Label	Measurement Level	Role	Column Width	Alignment
school	1	<none>	Nominal	Input	10	Left
sex	2	Student sex	Nominal	Input	10	Left
age	3	<none>	Scale	Input	8	Right
address	4	<none>	Nominal	Input	10	Left
famsize	5	<none>	Nominal	Input	10	Left
Pstatus	6	<none>	Nominal	Input	10	Left
Medu	7	<none>	Nominal	Input	8	Right
Fedu	8	<none>	Nominal	Input	8	Right
Mjob	9	<none>	Nominal	Input	20	Left
Fjob	10	<none>	Nominal	Input	20	Left
reason	11	<none>	Nominal	Input	20	Left
guardian	12	<none>	Nominal	Input	20	Left
traveltime	13	<none>	Nominal	Input	8	Right
studytime	14	<none>	Nominal	Input	8	Right
failures	15	<none>	Nominal	Input	8	Right
schoolsup	16	<none>	Nominal	Input	10	Left
famsup	17	<none>	Nominal	Input	10	Left
paid	18	<none>	Nominal	Input	10	Left
activities	19	<none>	Nominal	Input	10	Left
nursery	20	<none>	Nominal	Input	10	Left
higher	21	<none>	Nominal	Input	10	Left
internet	22	<none>	Nominal	Input	10	Left
romantic	23	<none>	Nominal	Input	10	Left
famrel	24	<none>	Nominal	Input	8	Right
freetime	25	<none>	Nominal	Input	8	Right
goout	26	<none>	Nominal	Input	8	Right
Dalc	27	<none>	Nominal	Input	8	Right
Walc	28	<none>	Nominal	Input	8	Right
health	29	<none>	Nominal	Input	8	Right
absences	30	<none>	Scale	Input	8	Right

Variable Information

Variable	Print Format	Write Format
school	A10	A10
sex	A10	A10
age	F8.2	F8.2
address	A10	A10
famsize	A10	A10
Pstatus	A10	A10
Medu	F8.2	F8.2
Fedu	F8.2	F8.2
Mjob	A20	A20
Fjob	A20	A20
reason	A20	A20
guardian	A20	A20
traveltime	F8.2	F8.2
studytime	F8.2	F8.2
failures	F8.2	F8.2
schoolsup	A10	A10
famsup	A10	A10
paid	A10	A10
activities	A10	A10
nursery	A10	A10
higher	A10	A10
internet	A10	A10
romantic	A10	A10
famrel	F8.2	F8.2
freetime	F8.2	F8.2
goout	F8.2	F8.2
Dalc	F8.2	F8.2
Walc	F8.2	F8.2
health	F8.2	F8.2
absences	F8.2	F8.2

Variable Information

Variable	Position	Label	Measurement Level	Role	Column Width	Alignment
G1	31	First period grade	Nominal	Input	8	Right
G2	32	Second period grade	Nominal	Input	8	Right
G3	33	Final grade score	Nominal	Input	8	Right
sex_num	34	Student sex numeric factor generated from sex	Nominal	Input	9	Right

Variable Information

Variable	Print Format	Write Format
G1	F8.2	F8.2
G2	F8.2	F8.2
G3	F8.2	F8.2
sex_num	F1	F1

Variables in the working file

Variable Values

Value		Label
sex_num	1	F
	2	M

Descriptives

Notes

Output Created		22-JUN-2026 23:33:25
Comments		
Input	Data	D:\DATA ANALYSIS\E ANOVA Family\Mixed MANOVA\SPSS_Output\sav\mixed_manova_spss_ready_data.sav
	Active Dataset	MixedMANOVAData
	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	All non-missing data are used.
Syntax		DESCRIPTIVES VARIABLES=G1 G2 G3 /STATISTICS=MEAN STDDEV MIN MAX.
Resources	Processor Time	00:00:00.06
	Elapsed Time	00:00:00.03

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
G1	649	.00	19.00	11.3991	2.74527
G2	649	.00	19.00	11.5701	2.91364
G3	649	.00	19.00	11.9060	3.23066
Valid N (listwise)	649				

Frequencies

Notes

Output Created		22-JUN-2026 23:33:25
Comments		
Input	Data	D:\DATA ANALYSIS\E ANOVA Family\Mixed MANOVA\SPSS_Output\sav\mixed_manova_spss_ready_data.sav
	Active Dataset	MixedMANOVAData
	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.
Syntax		FREQUENCIES VARIABLES=sex_num /ORDER=ANALYSIS.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.02

Statistics

sex_num

N	Valid	649
	Missing	0

sex_num

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	383	59.0	59.0	59.0
	2	266	41.0	41.0	100.0
	Total	649	100.0	100.0	

Means

Notes

Output Created		22-JUN-2026 23:33:25
Comments		
Input	Data	D:\DATA ANALYSIS\E ANOVA Family\Mixed MANOVA\SPSS_Output\sav\mixed_manova_spss_ready_data.sav
	Active Dataset	MixedMANOVAData
	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 sex_num /CELLS=COUNT MEAN STDDEV MEDIAN MIN MAX.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.03

Case Processing Summary

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

Report

sex_num		G1	G2	G3
1	N	383	383	383
	Mean	11.6371	11.8225	12.2533
	Std. Deviation	2.79423	2.96751	3.12415
	Median	12.0000	12.0000	12.0000
	Minimum	.00	.00	.00
	Maximum	19.00	19.00	19.00
2	N	266	266	266
	Mean	11.0564	11.2068	11.4060
	Std. Deviation	2.64086	2.80002	3.32069
	Median	11.0000	11.0000	11.0000
	Minimum	4.00	.00	.00
	Maximum	18.00	18.00	19.00
Total	N	649	649	649
	Mean	11.3991	11.5701	11.9060
	Std. Deviation	2.74527	2.91364	3.23066
	Median	11.0000	11.0000	12.0000
	Minimum	.00	.00	.00
	Maximum	19.00	19.00	19.00

Correlations

Notes

Output Created		22-JUN-2026 23:33:26
Comments		
Input	Data	D:\DATA ANALYSIS\E ANOVA Family\Mixed MANOVA\SPSS_Output\sav\mixed_manova_spss_ready_data.sav
	Active Dataset	MixedMANOVAData
	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 for each pair of variables are based on all the cases with valid data for that pair.
Syntax		CORRELATIONS /VARIABLES=G1 G2 G3 /PRINT=TWOTAIL NOSIG /MISSING=PAIRWISE.
Resources	Processor Time	00:00:00.09
	Elapsed Time	00:00:00.18

Correlations

		G1	G2	G3
G1	Pearson Correlation	1	.865**	.826**
	Sig. (2-tailed)		.000	.000
	N	649	649	649
G2	Pearson Correlation	.865**	1	.919**
	Sig. (2-tailed)	.000		.000
	N	649	649	649
G3	Pearson Correlation	.826**	.919**	1
	Sig. (2-tailed)	.000	.000	
	N	649	649	649

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

General Linear Model

Notes

Output Created		22-JUN-2026 23:33:26
Comments		
Input	Data	D:\DATA ANALYSIS\E ANOVA Family\Mixed MANOVA\SPSS_Output\sav\mixed_manova_spss_ready_data.sav
	Active Dataset	MixedMANOVAData
	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.

Notes

Syntax		GLM G1 G2 G3 BY sex_num /WSFACTOR=GradeTime 3 Polynomial /METHOD=SSTYPE(3) /PRINT=DESCRIPTIVE ETASQ HOMOGENEITY PARAMETER /PLOT=PROFILE (GradeTime*sex_num) /EMMEANS=TABLES (sex_num) /EMMEANS=TABLES (GradeTime) /EMMEANS=TABLES (GradeTime*sex_num) /CRITERIA=ALPHA(.05) /WSDESIGN=GradeTime /DESIGN=sex_num.
Resources	Processor Time	00:00:04.81
	Elapsed Time	00:00:09.28

Within-Subjects Factors

Measure: MEASURE_1

GradeTime	Dependent Variable
1	G1
2	G2
3	G3

Between-Subjects Factors

		Value Label	N
sex_num	1	F	383
	2	M	266

Descriptive Statistics

	sex_num	Mean	Std. Deviation	N
G1	1	11.6371	2.79423	383
	2	11.0564	2.64086	266
	Total	11.3991	2.74527	649
G2	1	11.8225	2.96751	383
	2	11.2068	2.80002	266
	Total	11.5701	2.91364	649
G3	1	12.2533	3.12415	383
	2	11.4060	3.32069	266
	Total	11.9060	3.23066	649

Box's Test of Equality of Covariance Matrices[a]

Box's M	41.630
F	6.902
df1	6
df2	2213064.321
Sig.	.000

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

a. Design: Intercept + sex_num
Within Subjects Design: GradeTime

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df
GradeTime	Pillai's Trace	.075	26.059[b]	2.000	646.000
	Wilks' Lambda	.925	26.059[b]	2.000	646.000
	Hotelling's Trace	.081	26.059[b]	2.000	646.000
	Roy's Largest Root	.081	26.059[b]	2.000	646.000
GradeTime * sex_num	Pillai's Trace	.009	2.775[b]	2.000	646.000
	Wilks' Lambda	.991	2.775[b]	2.000	646.000
	Hotelling's Trace	.009	2.775[b]	2.000	646.000
	Roy's Largest Root	.009	2.775[b]	2.000	646.000

Multivariate Tests[a]

Effect		Sig.	Partial Eta Squared
GradeTime	Pillai's Trace	.000	.075
	Wilks' Lambda	.000	.075
	Hotelling's Trace	.000	.075
	Roy's Largest Root	.000	.075
GradeTime * sex_num	Pillai's Trace	.063	.009
	Wilks' Lambda	.063	.009
	Hotelling's Trace	.063	.009
	Roy's Largest Root	.063	.009

a. Design: Intercept + sex_num
Within Subjects Design: GradeTime

b. Exact statistic

Mauchly's Test of Sphericity[a]

Measure: MEASURE_1

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b] Greenhouse-Geisser
GradeTime	.827	122.617	2	.000	.853

Mauchly's Test of Sphericity[a]

Measure: MEASURE_1

Within Subjects Effect	Epsilon[b] Huynh-Feldt	Lower-bound
GradeTime	.856	.500

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

a. Design: Intercept + sex_num
Within Subjects Design: GradeTime

b. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

Tests of Within-Subjects Effects

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F
GradeTime	Sphericity Assumed	75.480	2	37.740	31.813
	Greenhouse-Geisser	75.480	1.705	44.264	31.813
	Huynh-Feldt	75.480	1.712	44.091	31.813
	Lower-bound	75.480	1.000	75.480	31.813
GradeTime * sex_num	Sphericity Assumed	6.588	2	3.294	2.777
	Greenhouse-Geisser	6.588	1.705	3.863	2.777
	Huynh-Feldt	6.588	1.712	3.848	2.777
	Lower-bound	6.588	1.000	6.588	2.777
Error(GradeTime)	Sphericity Assumed	1535.081	1294	1.186	
	Greenhouse-Geisser	1535.081	1103.264	1.391	
	Huynh-Feldt	1535.081	1107.594	1.386	
	Lower-bound	1535.081	647.000	2.373	

Tests of Within-Subjects Effects

Measure: MEASURE_1

Source		Sig.	Partial Eta Squared
GradeTime	Sphericity Assumed	.000	.047
	Greenhouse-Geisser	.000	.047
	Huynh-Feldt	.000	.047
	Lower-bound	.000	.047
GradeTime * sex_num	Sphericity Assumed	.063	.004
	Greenhouse-Geisser	.071	.004
	Huynh-Feldt	.071	.004
	Lower-bound	.096	.004
Error(GradeTime)	Sphericity Assumed		
	Greenhouse-Geisser		
	Huynh-Feldt		
	Lower-bound		

Tests of Within-Subjects Contrasts

Measure: MEASURE_1

Source	GradeTime	Type III Sum of Squares	df	Mean Square	F	Sig.
GradeTime	Linear	73.213	1	73.213	44.331	.000
	Quadratic	2.266	1	2.266	3.143	.077
GradeTime * sex_num	Linear	5.577	1	5.577	3.377	.067
	Quadratic	1.011	1	1.011	1.402	.237
Error(GradeTime)	Linear	1068.532	647	1.652		
	Quadratic	466.549	647	.721		

Tests of Within-Subjects Contrasts

Measure: MEASURE_1

Source	GradeTime	Partial Eta Squared
GradeTime	Linear	.064
	Quadratic	.005
GradeTime * sex_num	Linear	.005
	Quadratic	.002
Error(GradeTime)	Linear	
	Quadratic	

Levene's Test of Equality of Error Variances[a]

		Levene Statistic	df1	df2	Sig.
G1	Based on Mean	1.292	1	647	.256
	Based on Median	1.258	1	647	.263
	Based on Median and with adjusted df	1.258	1	644.907	.263
	Based on trimmed mean	1.398	1	647	.237
G2	Based on Mean	.750	1	647	.387
	Based on Median	.961	1	647	.327
	Based on Median and with adjusted df	.961	1	645.870	.327
	Based on trimmed mean	.685	1	647	.408
G3	Based on Mean	.004	1	647	.950
	Based on Median	.007	1	647	.933
	Based on Median and with adjusted df	.007	1	633.314	.933
	Based on trimmed mean	.018	1	647	.895

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

a. Design: Intercept + sex_num
Within Subjects Design: GradeTime

Tests of Between-Subjects Effects

Measure: MEASURE_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	251888.112	1	251888.112	10590.986	.000	.942
sex_num	218.532	1	218.532	9.188	.003	.014
Error	15387.765	647	23.783			

Parameter Estimates

Dependent Variable	Parameter	B	Std. Error	t	Sig.	95% ... Lower Bound
G1	Intercept	11.056	.168	65.993	.000	10.727
	[sex_num=1]	.581	.218	2.663	.008	.152
	[sex_num=2]	0[a]	.	.	.	.
G2	Intercept	11.207	.178	63.025	.000	10.858
	[sex_num=1]	.616	.231	2.660	.008	.161
	[sex_num=2]	0[a]	.	.	.	.
G3	Intercept	11.406	.197	58.023	.000	11.020
	[sex_num=1]	.847	.256	3.311	.001	.345
	[sex_num=2]	0[a]	.	.	.	.

Parameter Estimates

Dependent Variable	Parameter	95% Confidence ... Upper Bound	Partial Eta Squared
G1	Intercept	11.385	.871
	[sex_num=1]	1.009	.011
	[sex_num=2]	.	.
G2	Intercept	11.556	.860
	[sex_num=1]	1.070	.011
	[sex_num=2]	.	.
G3	Intercept	11.792	.839
	[sex_num=1]	1.350	.017
	[sex_num=2]	.	.

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

Estimated Marginal Means

1. Student sex numeric factor generated from sex

Measure: MEASURE_1

Student sex numeric factor generated from sex	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
1	11.904	.144	11.622	12.187
2	11.223	.173	10.884	11.562

2. GradeTime

Measure: MEASURE_1

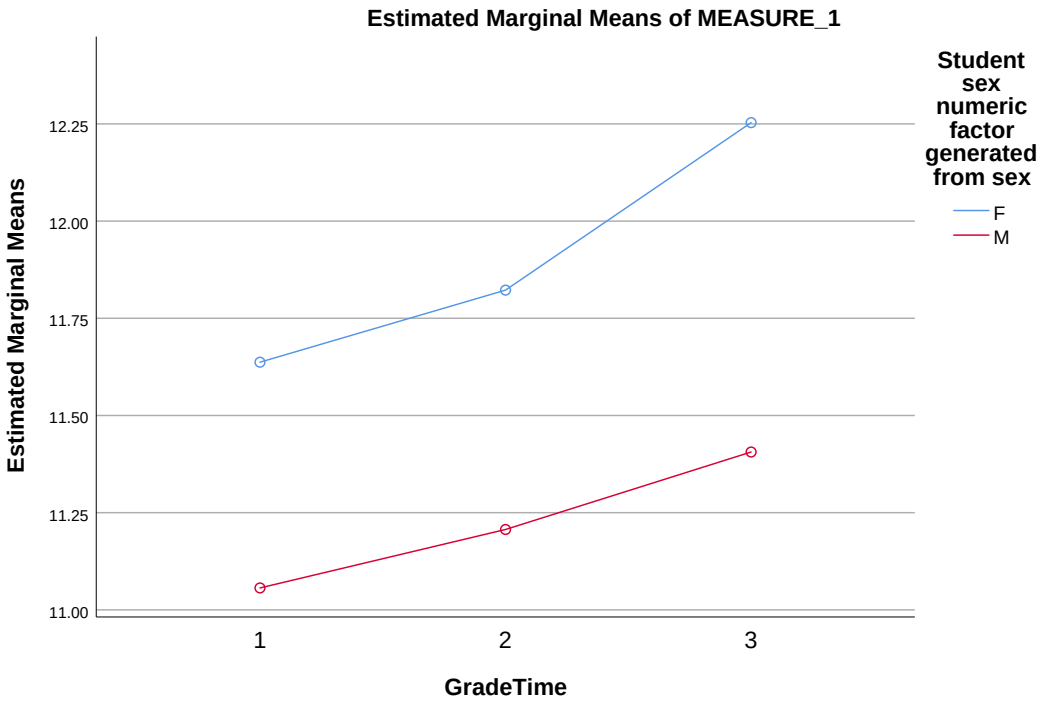
GradeTime	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
1	11.347	.109	11.133	11.561
2	11.515	.116	11.287	11.742
3	11.830	.128	11.578	12.081

3. GradeTime * Student sex numeric factor generated from sex

Measure: MEASURE_1

GradeTime	Student sex numeric factor generated from sex	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
1	1	11.637	.140	11.363	11.911
	2	11.056	.168	10.727	11.385
2	1	11.822	.148	11.531	12.113
	2	11.207	.178	10.858	11.556
3	1	12.253	.164	11.932	12.575
	2	11.406	.197	11.020	11.792

Profile Plots


Estimated Marginal Means of MEASURE_1
Estimated Marginal Means
12.25
12.00
11.75
11.50
11.25
11.00
1
2
3
GradeTime
Student sex numeric factor generated from sex
F
M