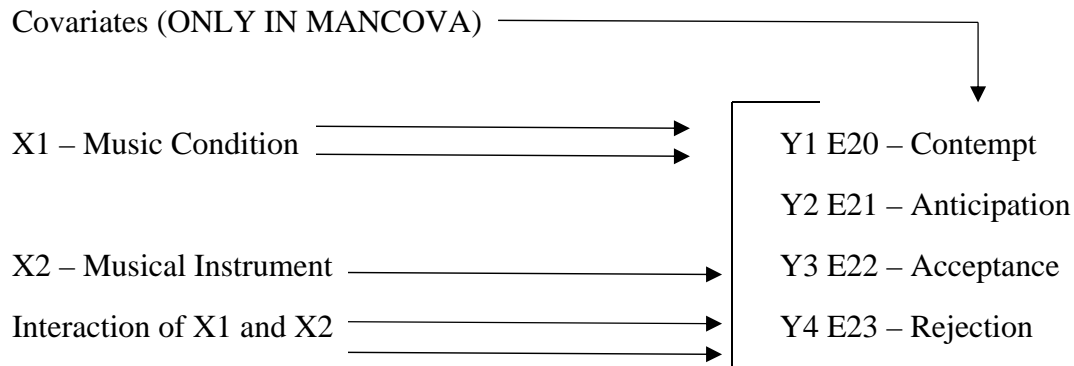


MANOVA/MANCOVA

Paul and Kaila

I. Model

From the Music and Film Experiment (Neuendorf et al.)



Variable Descriptions

Independent Variables

Music Condition – Nominal (3 Categories) – 1 = Rock music 2 = Classical Music 3 = No music

Musical Instrument – Nominal (2 Categories) – 0 = No 1 = Yes

Dependent Variables

All are on a metric 0 – 10 scale with 0 = Not at all, to 10 = Very much.

E20 - Feeling contempt

E21 - Feeling anticipation

E22 - Feeling acceptance

E23 - Feeling rejection

Covariates (ONLY IN MANCOVA)

E2 – Feeling surprised (on the metric 0 – 10 scale with 0 = Not at all, to 10 = Very much)

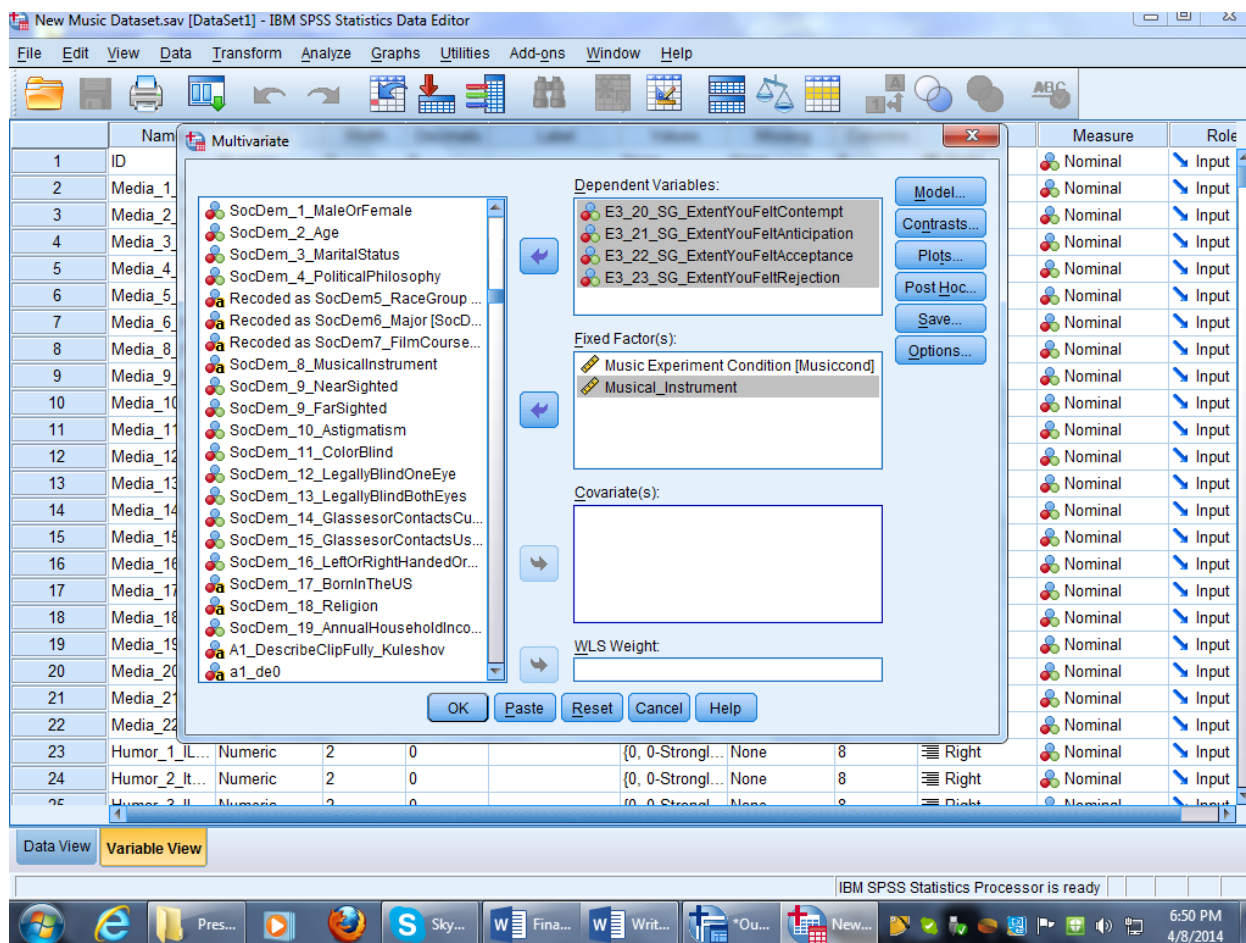
II. RUNNING SPSS

Analyze > General Linear Model > Multivariate

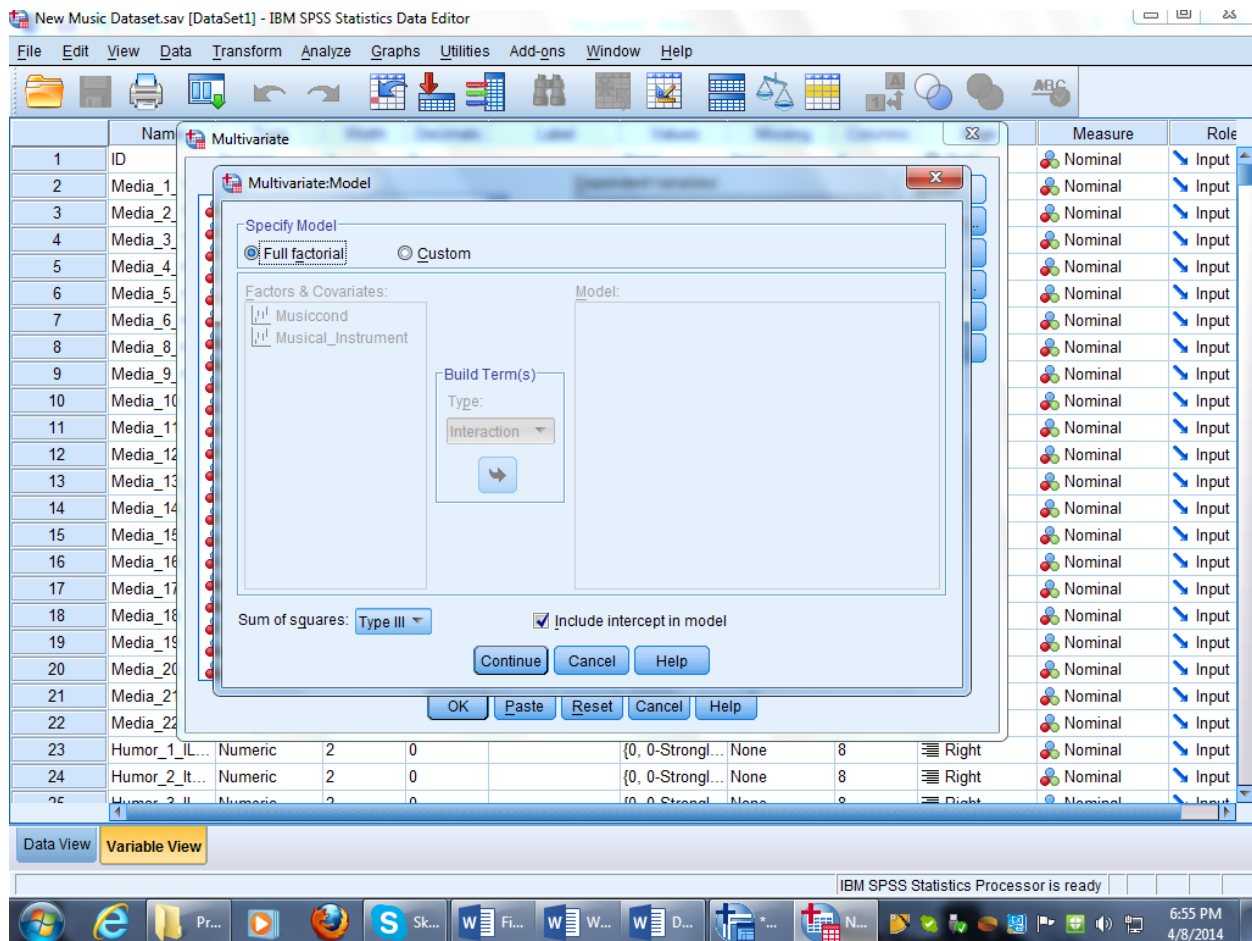
The screenshot shows the IBM SPSS Statistics Data Editor interface. The 'Analyze' menu is open, and the path 'General Linear Model > Multivariate' is selected. The 'Variable View' tab is active, displaying a list of variables with their names, types, and roles. The 'Multivariate...' option is highlighted in the menu.

Label	Values	Missing	Columns	Align	Measure	Role
Univariate...			8	Right	Nominal	Input
Multivariate...			37	Left	Nominal	Input
Repeated Measures...			34	Left	Nominal	Input
Variance Components...			16	Left	Nominal	Input
	None	None	6	Left	Nominal	Input
	None	None	7	Left	Nominal	Input
	None	None	10	Left	Nominal	Input
	None	None	3	Left	Nominal	Input
	None	None	3	Left	Nominal	Input
	None	None	8	Left	Nominal	Input
	None	None	14	Left	Nominal	Input
	None	None	10	Left	Nominal	Input
	None	None	10	Left	Nominal	Input
	None	None	4	Left	Nominal	Input
	None	None	7	Left	Nominal	Input
	None	None	10	Left	Nominal	Input
	None	None	4	Left	Nominal	Input
	None	None	4	Left	Nominal	Input
	None	None	3	Left	Nominal	Input
	None	None	3	Left	Nominal	Input
	None	None	8	Left	Nominal	Input
	{0, 0-Strongl...	None	8	Right	Nominal	Input
	{0, 0-Strongl...	None	8	Right	Nominal	Input
	{0, 0-Strongl...	None	8	Right	Nominal	Input

Dependent and Independent Variables added by clicking
 > arrow.



Go to the buttons on the right hand side > Model > Full factorial > continue.

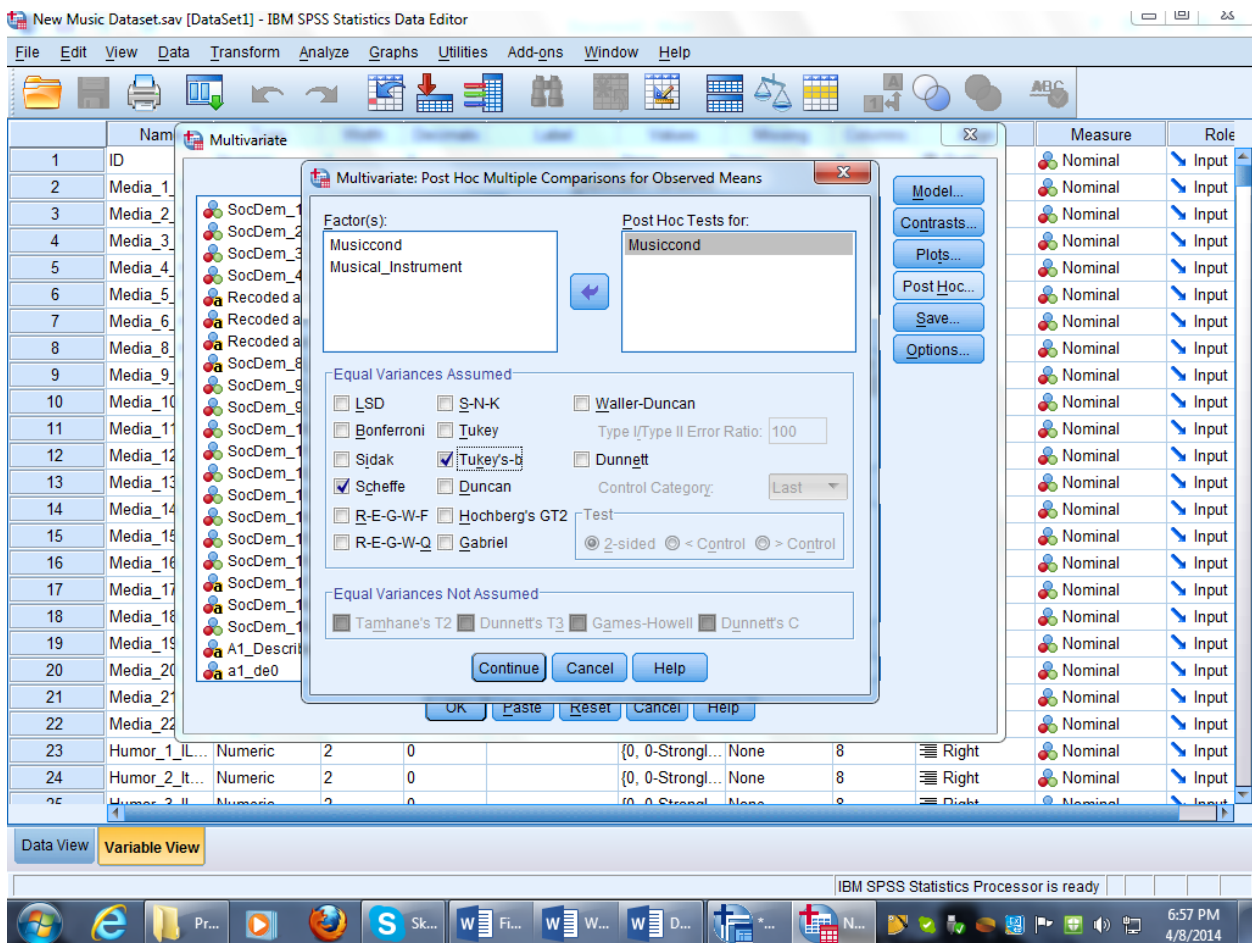


Click Post Hoc, move the condition variable over to the right using (>) then click:

>Scheffe

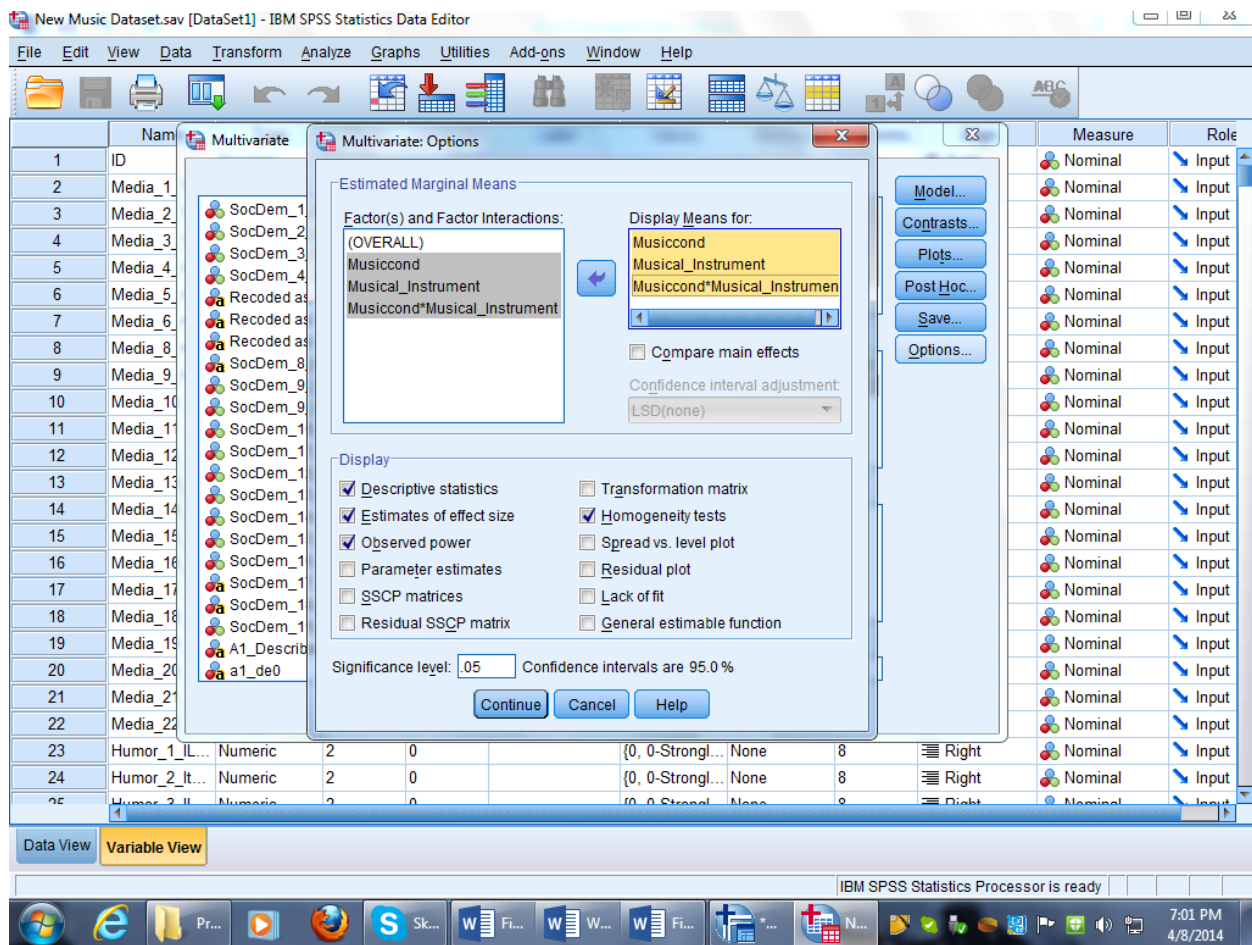
>Tukey's – b

Click Continue



Select options, highlight all factors in the left box underneath overall and click > to move them over.

Check the boxes for descriptive stats, estimates of effect on effect size, observed power, and homogeneity tests.



Click continue.

Click OK to run the MANOVA!!!!

III. SPSS OUTPUT

```
GET
  FILE='E:\Multivariate\Presentation\New Music Dataset.sav'.
DATASET NAME DataSet1 WINDOW=FRONT.
CORRELATIONS
  /VARIABLES=E3_20_SG_ExtentYouFeltContempt
E3_21_SG_ExtentYouFeltAnticipation
  E3_22_SG_ExtentYouFeltAcceptance E3_23_SG_ExtentYouFeltRejection
  /PRINT=TWOTAIL NOSIG
  /STATISTICS DESCRIPTIVES XPROD
  /MISSING=PAIRWISE.
```

Correlations

[DataSet1] E:\Multivariate\Presentation\New Music Dataset.sav

	Mean	Std. Deviation	N
E3_20_SG_ExtentYouFeltContempt	2.24	2.699	88
E3_21_SG_ExtentYouFeltAnticipation	3.53	3.467	88
E3_22_SG_ExtentYouFeltAcceptance	2.03	2.553	88
E3_23_SG_ExtentYouFeltRejection	2.38	2.842	88

Correlations

		E3_20_SG_ExtentYouFeltContempt	E3_21_SG_ExtentYouFeltAnticipation	E3_22_SG_ExtentYouFeltAcceptance	E3_23_SG_ExtentYouFeltRejection
E3_20_SG_ExtentYouFeltContempt	Pearson Correlation	1	.608**	.659**	.532**
	Sig. (2-tailed)		.000	.000	.000
	Sum of Squares and Cross-products	633.989	494.784	395.284	355.125
	Covariance	7.287	5.687	4.543	4.082
	N	88	88	88	88
E3_21_SG_ExtentYouFeltAnticipation	Pearson Correlation	.608**	1	.491**	.332**
	Sig. (2-tailed)	.000		.000	.002
	Sum of Squares and Cross-products	494.784	1045.898	378.398	284.375
	Covariance	5.687	12.022	4.349	3.269
	N	88	88	88	88
E3_22_SG_ExtentYouFeltAcceptance	Pearson Correlation	.659**	.491**	1	.417**
	Sig. (2-tailed)	.000	.000		.000
	Sum of Squares and Cross-products	395.284	378.398	566.898	262.875
	Covariance	4.543	4.349	6.516	3.022
	N	88	88	88	88
E3_23_SG_ExtentYouFeltRejection	Pearson Correlation	.532**	.332**	.417**	1
	Sig. (2-tailed)	.000	.002	.000	
	Sum of Squares and Cross-products	355.125	284.375	262.875	702.625
	Covariance	4.082	3.269	3.022	8.076
	N	88	88	88	88

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

```
GLM E3_20_SG_ExtentYouFeltContempt E3_21_SG_ExtentYouFeltAnticipation
    E3_22_SG_ExtentYouFeltAcceptance E3_23_SG_ExtentYouFeltRejection BY
Musical_Instrument Musiccond
/METHOD=SSTYPE(3)
/INTERCEPT=INCLUDE
/POSTHOC=Musiccond(BTUKEY SCHEFFE)
/PLOT=PROFILE(Musical_Instrument*Musiccond)
/EMMEANS=TABLES(Musical_Instrument)
/EMMEANS=TABLES(Musiccond)
```



```

/EMMEANS=TABLES(Musical_Instrument*Musiccond)
/PRINT=DESCRIPTIVE ETASQ OPOWER HOMOGENEITY
/CRITERIA=ALPHA(.05)
/DESIGN= Musical_Instrument Musiccond Musical_Instrument*Musiccond.

```

General Linear Model

[DataSet1] E:\Multivariate\Presentation\New Music Dataset.sav

Between-Subjects Factors

		Value Label	N
Musical_Instrument	.00		59
	1.00		29
Music Experiment Condition	1.00	1-Rock Music	32
	2.00	2-Classical Music	28
	3.00	3-No Music	28

Descriptive Statistics

		Music Experiment Musical_Instrument Condition	Mean	Std. Deviation	N
E3_20_SG_ExtentYouFeltContempt	.00	1-Rock Music	2.00	2.488	22
		2-Classical Music	2.12	2.713	17
		3-No Music	2.30	2.830	20
		Total	2.14	2.629	59
	1.00	1-Rock Music	.90	1.101	10
		2-Classical Music	3.36	2.908	11
		3-No Music	3.13	3.758	8
		Total	2.45	2.873	29
Total		1-Rock Music	1.66	2.194	32
		2-Classical Music	2.61	2.807	28
		3-No Music	2.54	3.073	28

		Total	2.24	2.699	88
E3_21_SG_ExtentYouFeltAnticipation	.00	1-Rock Music	3.14	3.044	22
		2-Classical Music	2.12	3.257	17
		3-No Music	4.35	3.856	20
		Total	3.25	3.457	59
	1.00	1-Rock Music	2.50	3.206	10
		2-Classical Music	4.00	3.130	11
		3-No Music	6.25	3.495	8
		Total	4.10	3.478	29
	Total	1-Rock Music	2.94	3.058	32
		2-Classical Music	2.86	3.285	28
		3-No Music	4.89	3.794	28
		Total	3.53	3.467	88
E3_22_SG_ExtentYouFeltAcceptance	.00	1-Rock Music	2.27	2.374	22
		2-Classical Music	1.59	2.476	17
		3-No Music	1.70	2.958	20
		Total	1.88	2.587	59
	1.00	1-Rock Music	1.20	2.150	10
		2-Classical Music	2.64	2.157	11
		3-No Music	3.38	3.021	8
		Total	2.34	2.497	29
	Total	1-Rock Music	1.94	2.327	32
		2-Classical Music	2.00	2.373	28
		3-No Music	2.18	3.019	28
		Total	2.03	2.553	88
E3_23_SG_ExtentYouFeltRejection	.00	1-Rock Music	2.32	2.679	22
		2-Classical Music	1.59	1.839	17
		3-No Music	1.90	3.243	20
		Total	1.97	2.659	59
	1.00	1-Rock Music	1.40	2.271	10
		2-Classical Music	4.09	3.015	11
		3-No Music	4.25	3.284	8
		Total	3.21	3.063	29
	Total	1-Rock Music	2.03	2.559	32
		2-Classical Music	2.57	2.631	28
		3-No Music	2.57	3.371	28
		Total	2.38	2.842	88

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

Box's M	90.680
F	1.534
df1	50
df2	5194.007
Sig.	.009

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

a. Design: Intercept + Musical_Instrument + Musiccond + Musical_Instrument * Musiccond

Multivariate Tests^d

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power ^b
Intercept	Pillai's Trace	.616	31.729 ^a	4.000	79.000	.000	.616	126.917	1.000
	Wilks' Lambda	.384	31.729 ^a	4.000	79.000	.000	.616	126.917	1.000
	Hotelling's Trace	1.607	31.729 ^a	4.000	79.000	.000	.616	126.917	1.000
	Roy's Largest Root	1.607	31.729 ^a	4.000	79.000	.000	.616	126.917	1.000
Musical_Instrument	Pillai's Trace	.078	1.667 ^a	4.000	79.000	.166	.078	6.668	.490
	Wilks' Lambda	.922	1.667 ^a	4.000	79.000	.166	.078	6.668	.490
	Hotelling's Trace	.084	1.667 ^a	4.000	79.000	.166	.078	6.668	.490

	Roy's Largest Root	.084	1.667 ^a	4.000	79.000	.166	.078	6.668	.490
Musiccond	Pillai's Trace	.160	1.744	8.000	160.000	.092	.080	13.956	.739
	Wilks' Lambda	.845	1.731 ^a	8.000	158.000	.095	.081	13.851	.735
	Hotelling's Trace	.176	1.718	8.000	156.000	.098	.081	13.744	.731
	Roy's Largest Root	.119	2.380 ^c	4.000	80.000	.059	.106	9.520	.662
Musical_Instrument * Musiccond	Pillai's Trace	.101	1.060	8.000	160.000	.394	.050	8.480	.482
	Wilks' Lambda	.900	1.067 ^a	8.000	158.000	.389	.051	8.537	.484
	Hotelling's Trace	.110	1.074	8.000	156.000	.384	.052	8.589	.487
	Roy's Largest Root	.102	2.032 ^c	4.000	80.000	.098	.092	8.128	.584

a. Exact statistic

b. Computed using alpha = .05

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

d. Design: Intercept + Musical_Instrument + Musiccond + Musical_Instrument * Musiccond

Levene's Test of Equality of Error Variances^a

	F	df1	df2	Sig.
E3_20_SG_ExtentYouFeltCont empt	3.417	5	82	.007
E3_21_SG_ExtentYouFeltAntic ipation	1.122	5	82	.355
E3_22_SG_ExtentYouFeltAcce ptance	.626	5	82	.680
E3_23_SG_ExtentYouFeltReje ction	1.229	5	82	.303

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

a. Design: Intercept + Musical_Instrument + Musiccond + Musical_Instrument * Musiccond

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent . Parameter	Observed Power ^b	
Corrected Model	E3_20_SG_ExtentYou FeltContempt	39.703 ^a	5	7.941	1.096	.369	.063	5.478	.372	
	E3_21_SG_ExtentYou FeltAnticipation	122.992 ^c	5	24.598	2.186	.064	.118	10.928	.689	
	E3_22_SG_ExtentYou FeltAcceptance	32.196 ^d	5	6.439	.987	.431	.057	4.937	.336	
	E3_23_SG_ExtentYou FeltRejection	85.126 ^e	5	17.025	2.261	.056	.121	11.304	.706	
	Intercept	E3_20_SG_ExtentYou FeltContempt	405.399	1	405.399	55.937	.000	.406	55.937	1.000
Intercept	E3_21_SG_ExtentYou FeltAnticipation	1062.772	1	1062.772	94.427	.000	.535	94.427	1.000	
	E3_22_SG_ExtentYou FeltAcceptance	346.952	1	346.952	53.207	.000	.394	53.207	1.000	
	E3_23_SG_ExtentYou FeltRejection	514.092	1	514.092	68.268	.000	.454	68.268	1.000	
	Musical_Instrument	E3_20_SG_ExtentYou FeltContempt	2.005	1	2.005	.277	.600	.003	.277	.081
		E3_21_SG_ExtentYou FeltAnticipation	21.050	1	21.050	1.870	.175	.022	1.870	.272
E3_22_SG_ExtentYou FeltAcceptance		5.793	1	5.793	.888	.349	.011	.888	.154	
E3_23_SG_ExtentYou FeltRejection		32.924	1	32.924	4.372	.040	.051	4.372	.542	
Musiccond		E3_20_SG_ExtentYou FeltContempt	28.884	2	14.442	1.993	.143	.046	3.985	.401

	E3_21_SG_ExtentYou FeltAnticipation	90.581	2	45.290	4.024	.022	.089	8.048	.703
	E3_22_SG_ExtentYou FeltAcceptance	8.014	2	4.007	.614	.543	.015	1.229	.149
	E3_23_SG_ExtentYou FeltRejection	21.660	2	10.830	1.438	.243	.034	2.876	.300
Musical_Instrument *	E3_20_SG_ExtentYou FeltContempt	21.022	2	10.511	1.450	.240	.034	2.901	.302
Musiccond	E3_21_SG_ExtentYou FeltAnticipation	28.235	2	14.117	1.254	.291	.030	2.509	.266
	E3_22_SG_ExtentYou FeltAcceptance	26.891	2	13.446	2.062	.134	.048	4.124	.413
	E3_23_SG_ExtentYou FeltRejection	49.710	2	24.855	3.301	.042	.075	6.601	.611
Error	E3_20_SG_ExtentYou FeltContempt	594.285	82	7.247					
	E3_21_SG_ExtentYou FeltAnticipation	922.906	82	11.255					
	E3_22_SG_ExtentYou FeltAcceptance	534.702	82	6.521					
	E3_23_SG_ExtentYou FeltRejection	617.499	82	7.530					
Total	E3_20_SG_ExtentYou FeltContempt	1075.000	88						
	E3_21_SG_ExtentYou FeltAnticipation	2145.000	88						
	E3_22_SG_ExtentYou FeltAcceptance	931.000	88						
	E3_23_SG_ExtentYou FeltRejection	1199.000	88						
Corrected Total	E3_20_SG_ExtentYou FeltContempt	633.989	87						
	E3_21_SG_ExtentYou FeltAnticipation	1045.898	87						
	E3_22_SG_ExtentYou FeltAcceptance	566.898	87						
	E3_23_SG_ExtentYou FeltRejection	702.625	87						

- a. R Squared = .063 (Adjusted R Squared = .005)
- b. Computed using alpha = .05
- c. R Squared = .118 (Adjusted R Squared = .064)
- d. R Squared = .057 (Adjusted R Squared = -.001)
- e. R Squared = .121 (Adjusted R Squared = .068)

Estimated Marginal Means

1. Musical_Instrument

Dependent Variable	Musical_Instrument	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
E3_20_SG_ExtentYouFeltCont empt	.00	2.139	.352	1.438	2.840
	1.00	2.463	.504	1.460	3.466
E3_21_SG_ExtentYouFeltAntic ipation	.00	3.201	.439	2.328	4.075
	1.00	4.250	.629	3.000	5.500
E3_22_SG_ExtentYouFeltAcce ptance	.00	1.854	.334	1.189	2.519
	1.00	2.404	.478	1.452	3.356
E3_23_SG_ExtentYouFeltReje ction	.00	1.935	.359	1.221	2.650
	1.00	3.247	.514	2.224	4.270

2. Music Experiment Condition

Dependent Variable	Music Experiment Condition	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
E3_20_SG_ExtentYouFeltCont empt	1-Rock Music	1.450	.513	.429	2.471
	2-Classical Music	2.741	.521	1.704	3.777
	3-No Music	2.713	.563	1.592	3.833
E3_21_SG_ExtentYouFeltAntic ipation	1-Rock Music	2.818	.640	1.546	4.091
	2-Classical Music	3.059	.649	1.768	4.350
	3-No Music	5.300	.702	3.904	6.696
E3_22_SG_ExtentYouFeltAcce ptance	1-Rock Music	1.736	.487	.768	2.705
	2-Classical Music	2.112	.494	1.129	3.095

	3-No Music	2.538	.534	1.475	3.600
E3_23_SG_ExtentYouFeltRejection	1-Rock Music	1.859	.523	.818	2.900
	2-Classical Music	2.840	.531	1.783	3.896
	3-No Music	3.075	.574	1.933	4.217

3. Musical_Instrument * Music Experiment Condition

Dependent Variable	Musical_Instrument	Music Experiment Condition	Mean	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
E3_20_SG_ExtentYouFeltContent	.00	1-Rock Music	2.000	.574	.858	3.142
		2-Classical Music	2.118	.653	.819	3.417
		3-No Music	2.300	.602	1.102	3.498
	1.00	1-Rock Music	.900	.851	-.794	2.594
		2-Classical Music	3.364	.812	1.749	4.978
		3-No Music	3.125	.952	1.232	5.018
E3_21_SG_ExtentYouFeltAnticipation	.00	1-Rock Music	3.136	.715	1.713	4.559
		2-Classical Music	2.118	.814	.499	3.736
		3-No Music	4.350	.750	2.858	5.842
	1.00	1-Rock Music	2.500	1.061	.390	4.610
		2-Classical Music	4.000	1.012	1.988	6.012
		3-No Music	6.250	1.186	3.890	8.610
E3_22_SG_ExtentYouFeltAcceptance	.00	1-Rock Music	2.273	.544	1.190	3.356
		2-Classical Music	1.588	.619	.356	2.820
		3-No Music	1.700	.571	.564	2.836
	1.00	1-Rock Music	1.200	.808	-.406	2.806
		2-Classical Music	2.636	.770	1.105	4.168
		3-No Music	3.375	.903	1.579	5.171
E3_23_SG_ExtentYouFeltRejection	.00	1-Rock Music	2.318	.585	1.154	3.482
		2-Classical Music	1.588	.666	.264	2.912
		3-No Music	1.900	.614	.679	3.121
	1.00	1-Rock Music	1.400	.868	-.326	3.126
		2-Classical Music	4.091	.827	2.445	5.737
		3-No Music	4.250	.970	2.320	6.180

Post Hoc Tests

Music Experiment Condition

Multiple Comparisons

Dependent Variable	(I) Music Experiment Condition	(J) Music Experiment Condition	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
E3_20_SG_Extent YouFeltContempt	1-Rock Music	2-Classical Music	-.95	.697	.398	-2.69	.79
		3-No Music	-.88	.697	.454	-2.62	.86
	2-Classical Music	1-Rock Music	.95	.697	.398	-.79	2.69
		3-No Music	.07	.719	.995	-1.72	1.87
	3-No Music	1-Rock Music	.88	.697	.454	-.86	2.62
		2-Classical Music	-.07	.719	.995	-1.87	1.72
E3_21_SG_Extent YouFeltAnticipation	1-Rock Music	2-Classical Music	.08	.868	.996	-2.08	2.24
		3-No Music	-1.96	.868	.085	-4.12	.21
	2-Classical Music	1-Rock Music	-.08	.868	.996	-2.24	2.08
		3-No Music	-2.04	.897	.082	-4.27	.20
	3-No Music	1-Rock Music	1.96	.868	.085	-.21	4.12
		2-Classical Music	2.04	.897	.082	-.20	4.27
E3_22_SG_Extent YouFeltAcceptance	1-Rock Music	2-Classical Music	-.06	.661	.996	-1.71	1.58
		3-No Music	-.24	.661	.936	-1.89	1.41
	2-Classical Music	1-Rock Music	.06	.661	.996	-1.58	1.71
		3-No Music	-.18	.682	.966	-1.88	1.52
	3-No Music	1-Rock Music	.24	.661	.936	-1.41	1.89
		2-Classical Music	.18	.682	.966	-1.52	1.88
E3_23_SG_Extent YouFeltRejection	1-Rock Music	2-Classical Music	-.54	.710	.750	-2.31	1.23
		3-No Music	-.54	.710	.750	-2.31	1.23
	2-Classical Music	1-Rock Music	.54	.710	.750	-1.23	2.31
		3-No Music	.00	.733	1.000	-1.83	1.83
	3-No Music	1-Rock Music	.54	.710	.750	-1.23	2.31
		2-Classical Music	.00	.733	1.000	-1.83	1.83

Multiple Comparisons

Dependent Variable		(I) Music Experiment Condition	(J) Music Experiment Condition	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
E3_20_SG_Extent YouFeltContempt	Scheffe	1-Rock Music	2-Classical Music	-.95	.697	.398	-2.69	.79
			3-No Music	-.88	.697	.454	-2.62	.86
	2-Classical Music	1-Rock Music	.95	.697	.398	-.79	2.69	
		3-No Music	.07	.719	.995	-1.72	1.87	
	3-No Music	1-Rock Music	.88	.697	.454	-.86	2.62	
		2-Classical Music	-.07	.719	.995	-1.87	1.72	
E3_21_SG_Extent YouFeltAnticipation	Scheffe	1-Rock Music	2-Classical Music	.08	.868	.996	-2.08	2.24
			3-No Music	-1.96	.868	.085	-4.12	.21
	2-Classical Music	1-Rock Music	-.08	.868	.996	-2.24	2.08	
		3-No Music	-2.04	.897	.082	-4.27	.20	
	3-No Music	1-Rock Music	1.96	.868	.085	-.21	4.12	
		2-Classical Music	2.04	.897	.082	-.20	4.27	
E3_22_SG_Extent YouFeltAcceptance	Scheffe	1-Rock Music	2-Classical Music	-.06	.661	.996	-1.71	1.58
			3-No Music	-.24	.661	.936	-1.89	1.41
	2-Classical Music	1-Rock Music	.06	.661	.996	-1.58	1.71	
		3-No Music	-.18	.682	.966	-1.88	1.52	
	3-No Music	1-Rock Music	.24	.661	.936	-1.41	1.89	
		2-Classical Music	.18	.682	.966	-1.52	1.88	
E3_23_SG_Extent YouFeltRejection	Scheffe	1-Rock Music	2-Classical Music	-.54	.710	.750	-2.31	1.23
			3-No Music	-.54	.710	.750	-2.31	1.23
	2-Classical Music	1-Rock Music	.54	.710	.750	-1.23	2.31	
		3-No Music	.00	.733	1.000	-1.83	1.83	
	3-No Music	1-Rock Music	.54	.710	.750	-1.23	2.31	
		2-Classical Music	.00	.733	1.000	-1.83	1.83	

Based on observed means.

The error term is Mean Square(Error) = 7.530.

Homogeneous Subsets

E3_20_SG_ExtentYouFeltContempt

Music Experiment Condition	N	Subset	
		1	
Tukey B ^{a,b}	1-Rock Music	32	1.66
	3-No Music	28	2.54
	2-Classical Music	28	2.61
Scheffe ^{a,b}	1-Rock Music	32	1.66
	3-No Music	28	2.54
	2-Classical Music	28	2.61
	Sig.		.406

Means for groups in homogeneous subsets are displayed.

Based on observed means.

The error term is Mean Square(Error) = 7.247.

a. Uses Harmonic Mean Sample Size = 29.217.

b. Alpha = .05.

E3_21_SG_ExtentYouFeltAnticipation

Music Experiment Condition	N	Subset	
		1	
Tukey B ^{a,b,c}	2-Classical Music	28	2.86
	1-Rock Music	32	2.94
	3-No Music	28	4.89
Scheffe ^{a,b,c}	2-Classical Music	28	2.86
	1-Rock Music	32	2.94
	3-No Music	28	4.89
	Sig.		.074

Means for groups in homogeneous subsets are displayed.

Based on observed means.

The error term is Mean Square(Error) = 11.255.

E3_21_SG_ExtentYouFeltAnticipation

Music Experiment Condition	N	Subset	
		1	
Tukey B ^{a,b,c}	2-Classical Music	28	2.86
	1-Rock Music	32	2.94
	3-No Music	28	4.89
Scheffe ^{a,b,c}	2-Classical Music	28	2.86
	1-Rock Music	32	2.94
	3-No Music	28	4.89
	Sig.		.074

Means for groups in homogeneous subsets are displayed.

Based on observed means.

The error term is Mean Square(Error) = 11.255.

- a. Uses Harmonic Mean Sample Size = 29.217.
- b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.
- c. Alpha = .05.

E3_22_SG_ExtentYouFeltAcceptance

Music Experiment Condition	N	Subset	
		1	
Tukey B ^{a,b}	1-Rock Music	32	1.94
	2-Classical Music	28	2.00
	3-No Music	28	2.18
Scheffe ^{a,b}	1-Rock Music	32	1.94
	2-Classical Music	28	2.00
	3-No Music	28	2.18
	Sig.		.937

Means for groups in homogeneous subsets are displayed.

Based on observed means.

The error term is Mean Square(Error) = 6.521.

- a. Uses Harmonic Mean Sample Size = 29.217.
- b. Alpha = .05.

E3_23_SG_ExtentYouFeltRejection

Music Experiment		N	Subset
Condition			1
Tukey B ^{a,b}	1-Rock Music	32	2.03
	3-No Music	28	2.57
	2-Classical Music	28	2.57
Scheffe ^{a,b}	1-Rock Music	32	2.03
	3-No Music	28	2.57
	2-Classical Music	28	2.57
Sig.			.754

Means for groups in homogeneous subsets are displayed.

Based on observed means.

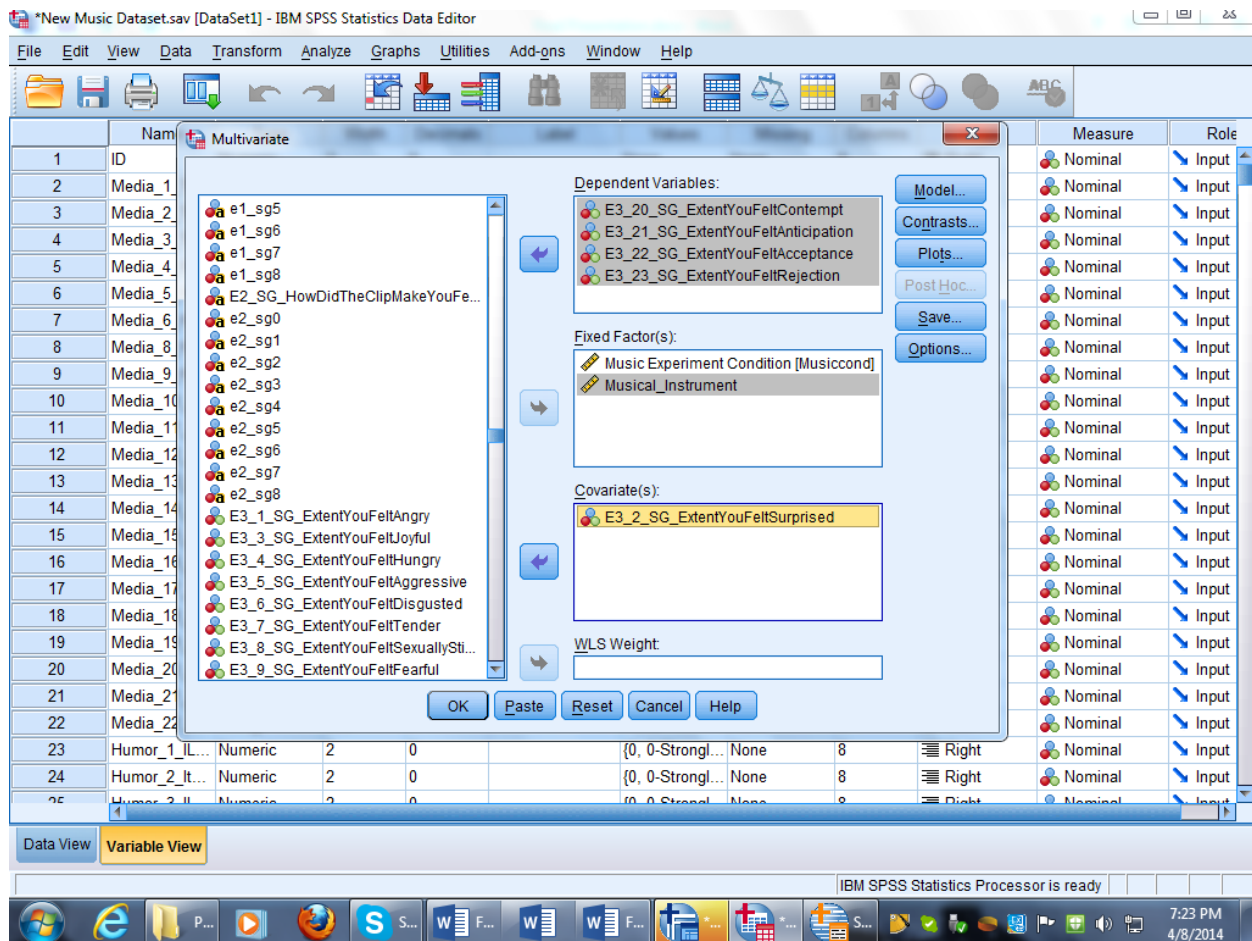
The error term is Mean Square(Error) = 7.530.

a. Uses Harmonic Mean Sample Size = 29.217.

b. Alpha = .05.

To run a MANCOVA, it's quite simple...

Follow the same steps as MANOVA, just add in your covariates under the fixed factor box.



You will repeat all the steps in Model, Plots, and Options menus, but you cannot do any Post Hoc tests in MANCOVA.

Click OK to run MANCOVA!!!!

CORRELATIONS

```

/VARIABLES=E3_2_SG_ExtentYouFeltSurprised E3_20_SG_ExtentYouFeltContempt
E3_21_SG_ExtentYouFeltAnticipation E3_22_SG_ExtentYouFeltAcceptance
E3_23_SG_ExtentYouFeltRejection
/PRINT=TWOTAIL NOSIG
/MISSING=PAIRWISE.

```

Correlations

[DataSet1] E:\Multivariate\Presentation\New Music Dataset.sav

		E3_2_SG_E xtentYouFelt Surprised	E3_20_SG_E xtentYouFelt Contempt	E3_21_SG_E xtentYouFelt Anticipation	E3_22_SG_E xtentYouFelt Acceptance	E3_23_SG_E xtentYouFelt Rejection
E3_2_SG_Extent YouFeltSurprised	Pearson	1	.469**	.659**	.491**	.184
	Correlation					
	Sig. (2-tailed)		.000	.000	.000	.086
	N	88	88	88	88	88
E3_20_SG_Ext entYouFeltCont empt	Pearson	.469**	1	.608**	.659**	.532**
	Correlation					
	Sig. (2-tailed)	.000		.000	.000	.000
	N	88	88	88	88	88
E3_21_SG_Ext entYouFeltAntic ipation	Pearson	.659**	.608**	1	.491**	.332**
	Correlation					
	Sig. (2-tailed)	.000	.000		.000	.002
	N	88	88	88	88	88
E3_22_SG_Ext entYouFeltAccept ance	Pearson	.491**	.659**	.491**	1	.417**
	Correlation					
	Sig. (2-tailed)	.000	.000	.000		.000
	N	88	88	88	88	88

E3_23_SG_ExtentYouFeltRejection	Pearson Correlation	.184	.532**	.332**	.417**	1
	Sig. (2-tailed)	.086	.000	.002	.000	
	N	88	88	88	88	88

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

```

DATASET ACTIVATE DataSet1.
GLM E3_20_SG_ExtentYouFeltContempt E3_21_SG_ExtentYouFeltAnticipation
    E3_22_SG_ExtentYouFeltAcceptance E3_23_SG_ExtentYouFeltRejection BY
Musiccond Musical_Instrument
    WITH E3_2_SG_ExtentYouFeltSurprised
    /METHOD=SSTYPE(3)
    /INTERCEPT=INCLUDE
    /PLOT=PROFILE(Musiccond*Musical_Instrument)
    /EMMEANS=TABLES(Musiccond) WITH(E3_2_SG_ExtentYouFeltSurprised=MEAN)
    /EMMEANS=TABLES(Musical_Instrument)
WITH(E3_2_SG_ExtentYouFeltSurprised=MEAN)
    /EMMEANS=TABLES(Musiccond*Musical_Instrument)
WITH(E3_2_SG_ExtentYouFeltSurprised=MEAN)
    /PRINT=DESCRIPTIVE ETASQ OPOWER HOMOGENEITY
    /CRITERIA=ALPHA(.05)
    /DESIGN=E3_2_SG_ExtentYouFeltSurprised Musiccond Musical_Instrument
Musiccond*Musical_Instrument.

```

General Linear Model

[DataSet1] E:\Multivariate\Presentation\New Music Dataset.sav

Between-Subjects Factors

		Value Label	N
Music Experiment Condition	1.00	1-Rock Music	32
	2.00	2-Classical Music	28
	3.00	3-No Music	28
Musical_Instrument	.00		59
	1.00		29

Descriptive Statistics

	Music Experiment		Mean	Std. Deviation	N
	Condition	Musical_Instrument			
E3_20_SG_ExtentYouFeltContempt	1-Rock Music	.00	2.00	2.488	22
		1.00	.90	1.101	10
		Total	1.66	2.194	32
	2-Classical Music	.00	2.12	2.713	17
		1.00	3.36	2.908	11
		Total	2.61	2.807	28
	3-No Music	.00	2.30	2.830	20
		1.00	3.13	3.758	8
		Total	2.54	3.073	28
	Total	.00	2.14	2.629	59
		1.00	2.45	2.873	29
		Total	2.24	2.699	88
E3_21_SG_ExtentYouFeltAnticipation	1-Rock Music	.00	3.14	3.044	22
		1.00	2.50	3.206	10
		Total	2.94	3.058	32
	2-Classical Music	.00	2.12	3.257	17
		1.00	4.00	3.130	11
		Total	2.86	3.285	28
	3-No Music	.00	4.35	3.856	20
		1.00	6.25	3.495	8
		Total	4.89	3.794	28
	Total	.00	3.25	3.457	59
		1.00	4.10	3.478	29
		Total	3.53	3.467	88
E3_22_SG_ExtentYouFeltAcceptance	1-Rock Music	.00	2.27	2.374	22
		1.00	1.20	2.150	10
		Total	1.94	2.327	32
	2-Classical Music	.00	1.59	2.476	17
		1.00	2.64	2.157	11
		Total	2.00	2.373	28
	3-No Music	.00	1.70	2.958	20
		1.00	3.38	3.021	8
		Total	2.18	3.019	28
	Total	.00	1.88	2.587	59

		1.00	2.34	2.497	29
		Total	2.03	2.553	88
E3_23_SG_ExtentYouFeltRejection	1-Rock Music	.00	2.32	2.679	22
		1.00	1.40	2.271	10
		Total	2.03	2.559	32
	2-Classical Music	.00	1.59	1.839	17
		1.00	4.09	3.015	11
		Total	2.57	2.631	28
	3-No Music	.00	1.90	3.243	20
		1.00	4.25	3.284	8
		Total	2.57	3.371	28
	Total	.00	1.97	2.659	59
		1.00	3.21	3.063	29
		Total	2.38	2.842	88

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

Box's M	90.680
F	1.534
df1	50
df2	5194.007
Sig.	.009

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

a. Design: Intercept + E3_2_SG_ExtentYouFelt Surprised + Musiccond + Musical_Instrument + Musiccond * Musical_Instrument

Multivariate Tests^d

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power ^b
Intercept	Pillai's Trace	.168	3.950 ^a	4.000	78.000	.006	.168	15.800	.888
	Wilks' Lambda	.832	3.950 ^a	4.000	78.000	.006	.168	15.800	.888
	Hotelling's Trace	.203	3.950 ^a	4.000	78.000	.006	.168	15.800	.888
	Roy's Largest Root	.203	3.950 ^a	4.000	78.000	.006	.168	15.800	.888
E3_2_SG_Extent YouFeltSurprised	Pillai's Trace	.468	17.144 ^a	4.000	78.000	.000	.468	68.576	1.000
	Wilks' Lambda	.532	17.144 ^a	4.000	78.000	.000	.468	68.576	1.000
	Hotelling's Trace	.879	17.144 ^a	4.000	78.000	.000	.468	68.576	1.000
	Roy's Largest Root	.879	17.144 ^a	4.000	78.000	.000	.468	68.576	1.000
Musiccond	Pillai's Trace	.129	1.360	8.000	158.000	.218	.064	10.876	.606
	Wilks' Lambda	.874	1.356 ^a	8.000	156.000	.220	.065	10.846	.605
	Hotelling's Trace	.140	1.352	8.000	154.000	.222	.066	10.813	.603
	Roy's Largest Root	.109	2.145 ^c	4.000	79.000	.083	.098	8.582	.610
Musical_Instrument	Pillai's Trace	.082	1.740 ^a	4.000	78.000	.150	.082	6.961	.509
	Wilks' Lambda	.918	1.740 ^a	4.000	78.000	.150	.082	6.961	.509
	Hotelling's Trace	.089	1.740 ^a	4.000	78.000	.150	.082	6.961	.509
	Roy's Largest Root	.089	1.740 ^a	4.000	78.000	.150	.082	6.961	.509
Musiccond * Musical_Instrument	Pillai's Trace	.083	.853	8.000	158.000	.558	.041	6.823	.387
	Wilks' Lambda	.918	.854 ^a	8.000	156.000	.557	.042	6.831	.387
	Hotelling's Trace	.089	.855	8.000	154.000	.556	.043	6.836	.388
	Roy's Largest Root	.080	1.579 ^c	4.000	79.000	.188	.074	6.316	.467

a. Exact statistic

b. Computed using alpha = .05

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

d. Design: Intercept + E3_2_SG_ExtentYouFeltSurprised + Musiccond + Musical_Instrument + Musiccond * Musical_Instrument

Levene's Test of Equality of Error Variances^a

	F	df1	df2	Sig.
E3_20_SG_ExtentYouFeltContempt	3.487	5	82	.007
E3_21_SG_ExtentYouFeltAnticipation	.973	5	82	.439

E3_22_SG_ExtentYouFeltAcceptance	.597	5	82	.702
E3_23_SG_ExtentYouFeltRejection	1.298	5	82	.273

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

a. Design: Intercept + E3_2_SG_ExtentYouFeltSurprised + Musiccond + Musical_Instrument + Musiccond * Musical_Instrument

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power ^b
Corrected Model	E3_20_SG_ExtentYouFeltContempt	155.869 ^a	6	25.978	4.401	.001	.246	26.406	.977
	E3_21_SG_ExtentYouFeltAnticipation	508.793 ^c	6	84.799	12.788	.000	.486	76.730	1.000
	E3_22_SG_ExtentYouFeltAcceptance	155.566 ^d	6	25.928	5.106	.000	.274	30.634	.991
	E3_23_SG_ExtentYouFeltRejection	96.949 ^e	6	16.158	2.161	.055	.138	12.965	.738
Intercept	E3_20_SG_ExtentYouFeltContempt	10.878	1	10.878	1.843	.178	.022	1.843	.269
	E3_21_SG_ExtentYouFeltAnticipation	12.802	1	12.802	1.931	.168	.023	1.931	.279
	E3_22_SG_ExtentYouFeltAcceptance	4.568	1	4.568	.899	.346	.011	.899	.155
	E3_23_SG_ExtentYouFeltRejection	114.700	1	114.700	15.339	.000	.159	15.339	.972
E3_2_SG_ExtentYouFeltSurprised	E3_20_SG_ExtentYouFeltContempt	116.166	1	116.166	19.680	.000	.195	19.680	.992
	E3_21_SG_ExtentYouFeltAnticipation	385.801	1	385.801	58.182	.000	.418	58.182	1.000
	E3_22_SG_ExtentYouFeltAcceptance	123.370	1	123.370	24.294	.000	.231	24.294	.998
	E3_23_SG_ExtentYouFeltRejection	11.823	1	11.823	1.581	.212	.019	1.581	.237

Musiccond	E3_20_SG_ExtentYou	8.850	2	4.425	.750	.476	.018	1.499	.173
	FeltContempt								
	E3_21_SG_ExtentYou	29.992	2	14.996	2.262	.111	.053	4.523	.448
	FeltAnticipation								
	E3_22_SG_ExtentYou	.162	2	.081	.016	.984	.000	.032	.052
	FeltAcceptance								
Musical_Instrument	E3_23_SG_ExtentYou	13.107	2	6.553	.876	.420	.021	1.753	.196
	FeltRejection								
	E3_20_SG_ExtentYou	1.190	1	1.190	.202	.655	.002	.202	.073
	FeltContempt								
	E3_21_SG_ExtentYou	15.958	1	15.958	2.407	.125	.029	2.407	.335
	FeltAnticipation								
Musiccond *	E3_22_SG_ExtentYou	4.291	1	4.291	.845	.361	.010	.845	.149
	FeltAcceptance								
	E3_23_SG_ExtentYou	31.717	1	31.717	4.242	.043	.050	4.242	.530
	FeltRejection								
	E3_20_SG_ExtentYou	10.474	2	5.237	.887	.416	.021	1.774	.198
	FeltContempt								
Musical_Instrument	E3_21_SG_ExtentYou	7.177	2	3.589	.541	.584	.013	1.082	.137
	FeltAnticipation								
	E3_22_SG_ExtentYou	12.134	2	6.067	1.195	.308	.029	2.389	.255
	FeltAcceptance								
	E3_23_SG_ExtentYou	42.349	2	21.174	2.832	.065	.065	5.663	.541
	FeltRejection								
Error	E3_20_SG_ExtentYou	478.120	81	5.903					
	FeltContempt								
	E3_21_SG_ExtentYou	537.105	81	6.631					
	FeltAnticipation								
	E3_22_SG_ExtentYou	411.332	81	5.078					
	FeltAcceptance								
Total	E3_23_SG_ExtentYou	605.676	81	7.477					
	FeltRejection								
	E3_20_SG_ExtentYou	1075.000	88						
	FeltContempt								
	E3_21_SG_ExtentYou	2145.000	88						
	FeltAnticipation								
Total	E3_22_SG_ExtentYou	931.000	88						
	FeltAcceptance								

	E3_23_SG_ExtentYou FeltRejection	1199.000	88						
Corrected Total	E3_20_SG_ExtentYou FeltContempt	633.989	87						
	E3_21_SG_ExtentYou FeltAnticipation	1045.898	87						
	E3_22_SG_ExtentYou FeltAcceptance	566.898	87						
	E3_23_SG_ExtentYou FeltRejection	702.625	87						

- a. R Squared = .246 (Adjusted R Squared = .190)
- b. Computed using alpha = .05
- c. R Squared = .486 (Adjusted R Squared = .448)
- d. R Squared = .274 (Adjusted R Squared = .221)
- e. R Squared = .138 (Adjusted R Squared = .074)

Estimated Marginal Means

1. Music Experiment Condition

Dependent Variable	Music Experiment Condition	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
E3_20_SG_ExtentYouFeltContempt	1-Rock Music	1.858 ^a	.472	.918	2.798
	2-Classical Music	2.677 ^a	.470	1.741	3.612
	3-No Music	2.280 ^a	.517	1.250	3.310
E3_21_SG_ExtentYouFeltAnticipation	1-Rock Music	3.562 ^a	.501	2.566	4.558
	2-Classical Music	2.942 ^a	.498	1.950	3.934
	3-No Music	4.512 ^a	.548	3.421	5.603
E3_22_SG_ExtentYouFeltAcceptance	1-Rock Music	2.157 ^a	.438	1.285	3.029
	2-Classical Music	2.046 ^a	.436	1.178	2.914
	3-No Music	2.092 ^a	.480	1.137	3.047
E3_23_SG_ExtentYouFeltRejection	1-Rock Music	1.989 ^a	.532	.932	3.047
	2-Classical Music	2.819 ^a	.529	1.766	3.872

3-No Music	2.937 ^a	.582	1.778	4.096
------------	--------------------	------	-------	-------

a. Covariates appearing in the model are evaluated at the following values: E3_2_SG_ExtentYouFeltSurprised = 4.34.

2. Musical_Instrument

Dependent Variable	Musical_Instrument	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
E3_20_SG_ExtentYouFeltContempt	.00	2.147 ^a	.318	1.514	2.780
	1.00	2.396 ^a	.455	1.490	3.302
E3_21_SG_ExtentYouFeltAnticipation	.00	3.215 ^a	.337	2.544	3.886
	1.00	4.129 ^a	.483	3.168	5.089
E3_22_SG_ExtentYouFeltAcceptance	.00	1.861 ^a	.295	1.274	2.449
	1.00	2.335 ^a	.422	1.495	3.176
E3_23_SG_ExtentYouFeltRejection	.00	1.938 ^a	.358	1.226	2.650
	1.00	3.226 ^a	.513	2.206	4.246

a. Covariates appearing in the model are evaluated at the following values: E3_2_SG_ExtentYouFeltSurprised = 4.34.

3. Music Experiment Condition * Musical_Instrument

Dependent Variable	Music Experiment Condition	Musical_Instrument	Mean	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
E3_20_SG_ExtentYouFeltContempt	1-Rock Music	.00	2.197 ^a	.520	1.163	3.232
		1.00	1.519 ^a	.781	-.035	3.073
	2-Classical Music	.00	2.135 ^a	.589	.963	3.308
		1.00	3.218 ^a	.733	1.759	4.677
E3_21_SG_ExtentYouFeltAnticipation	1-Rock Music	.00	3.496 ^a	.551	2.399	4.592
		1.00	3.628 ^a	.828	1.981	5.275
	2-Classical Music	.00	2.150 ^a	.625	.907	3.392
		1.00	3.734 ^a	.777	2.188	5.281

	3-No Music	.00	4.000 ^a	.578	2.851	5.149
		1.00	5.024 ^a	.925	3.184	6.863
E3_22_SG_ExtentYouFeltAcceptance	1-Rock Music	.00	2.476 ^a	.482	1.516	3.435
		1.00	1.838 ^a	.724	.397	3.279
	2-Classical Music	.00	1.606 ^a	.547	.519	2.694
		1.00	2.486 ^a	.680	1.133	3.839
	3-No Music	.00	1.502 ^a	.505	.496	2.508
		1.00	2.682 ^a	.809	1.072	4.291
E3_23_SG_ExtentYouFeltRejection	1-Rock Music	.00	2.381 ^a	.585	1.217	3.545
		1.00	1.597 ^a	.879	-.151	3.346
	2-Classical Music	.00	1.594 ^a	.663	.274	2.913
		1.00	4.044 ^a	.825	2.402	5.687
	3-No Music	.00	1.839 ^a	.613	.618	3.059
		1.00	4.035 ^a	.982	2.082	5.989

a. Covariates appearing in the model are evaluated at the following values: E3_2_SG_ExtentYouFeltSurprised = 4.34.

IV. TABLING RESULTS

Effect		Value	F – Value	Sig.	Observed Power
Music Condition	Pillai's Trace	.16	1.74	.09	.74
	Wilks' Lambda	.85	1.73 _a	.10	.74
	Hotelling's Trace	.18	1.72	.10	.73
	Roy's Largest Root	.12	2.38 _c	.06	.66
Musical Instrument	Pillai's Trace	.08	1.67 _a	.17	.49
	Wilks' Lambda	.92	1.67 _a	.17	.49
	Hotelling's Trace	.08	1.67 _a	.17	.49
	Roy's Largest Root	.08	1.67 _a	.17	.49
Musical Condition X Musical Instrument	Pillai's Trace	.10	1.06	.39	.48
	Wilks' Lambda	.90	1.07 _a	.39	.48
	Hotelling's Trace	.11	1.07	.38	.49
	Roy's Largest Root	.10	2.03 _c	.10	.58

Table 1: Multivariate Statistics for MANOVA

-
- a. Exact statistic
 - b. Computed using $\alpha = .05$
 - c. The statistic is an upper bound on F that yields a lower bound on the sig. level.



Table 2

Two-Factor ANOVA Predicting Contempt from Condition and Musical Instrument Use

	Mean	Sum of Squares	df	Mean Square	F	Sig.
Condition		28.88	2	14.44	1.99	.14
1 – Rock	1.66					
2 – Classical	2.61					
3 – No Music	2.54					
Musical Instrument		2.01	1	2.01	0.28	.60
0 – No	2.14					
1 – Yes	2.45					
Condition X Musical Instrument Interaction		21.02	2	10.51	1.45	.24
Error		594.29	82	7.25		
Corrected Total		633.99	87			

Table 3

Two-Factor ANOVA Predicting Anticipation from Condition and Musical Instrument Use

	Mean	Sum of Squares	df	Mean Square	F	Sig.
Condition		90.60	2	45.30	4.02	.02
1 – Rock _a	3.14					
2 – Classical _a	2.12					
3 – No Music _b	4.35					
Musical Instrument		21.10	1	21.10	1.87	.18
0 – No	3.25					
1 – Yes	4.10					
Condition X Musical Instrument Interaction		28.24	2	14.12	1.15	.29
Error		922.91	82	11.26		
Corrected Total		1045.90	87			

a, b = Means that do not share a subscript are near-significantly different via the Scheffe post hoc test.

Table 4

Two-Factor ANOVA Predicting Acceptance from Condition and Musical Instrument Use

	Mean	Sum of Squares	df	Mean Square	F	Sig.
Condition		8.01	2	4.01	.61	.54
1 – Rock	2.27					
2 – Classical	1.59					
3 – No Music	1.70					
Musical Instrument		5.80	1	5.80	.89	.35
0 – No	1.88					
1 – Yes	2.34					
Condition X Musical Instrument Interaction		26.89	2	13.45	2.06	.13
Error		534.70	82	6.52		
Corrected Total		566.90	87			

Table 5

Two-Factor ANOVA Predicting Rejection from Condition and Musical Instrument Use

	Mean	Sum of Squares	df	Mean Square	F	Sig.
Condition		21.66	2	10.83	1.44	.24
1 – Rock	2.32					
2 – Classical	1.59					
3 – No Music	1.90					
Musical Instrument		32.92	1	32.92	4.37	.04
0 – No	1.97					
1 – Yes	3.21					
Condition X Musical Instrument Interaction		49.71	2	24.86	3.30	.04
Error		617.50	82	7.53		
Corrected Total		702.63	87			

Table 6: Multivariate Statistics for MANCOVA

Effect		Value	F – Value	Sig.	Observed Power
Surprised (C)	Pillai’s Trace	.47	17.14	<.01	1.00
	Wilks’ Lambda	.53	17.14	<.01	1.00
	Hotelling’s Trace	.88	17.14	<.01	1.00
	Roy’s Largest Root	.88	17.14	<.01	1.00
Music Condition	Pillai’s Trace	.13	1.36	.21	.61
	Wilks’ Lambda	.87	1.36 _a	.22	.61
	Hotelling’s Trace	.14	1.35	.22	.60
	Roy’s Largest Root	.11	2.15 _c	.08	.61
Musical Instrument	Pillai’s Trace	.08	1.74 _a	.15	.51
	Wilks’ Lambda	.92	1.74 _a	.15	.51
	Hotelling’s Trace	.09	1.74 _a	.15	.51
	Roy’s Largest Root	.09	1.74 _a	.15	.51
Musical Condition X Musical Instrument	Pillai’s Trace	.08	.85	.56	.39
	Wilks’ Lambda	.92	.85 _a	.56	.39
	Hotelling’s Trace	.09	.86	.56	.39
	Roy’s Largest Root	.08	1.58 _c	.19	.47

- a. Exact statistic
- b. Computed using alpha = .05
- c. The statistic is an upper bound on F that yields a lower bound on the sig. level.

Table 7

Two-Factor ANCOVA Predicting Contempt from Condition and Musical Instrument Use

	Mean	Sum of Squares	df	Mean Square	F	Sig.
Surprise (C)	-	116.17	1	116.17	19.68	<.01
Condition		8.85	2	4.43	.75	.48
1 – Rock	1.66					
2 – Classical	2.61					
3 – No Music	2.54					
Musical Instrument		1.19	1	1.19	.20	.66
0 – No	2.14					
1 – Yes	2.45					
Condition X Musical Instrument Interaction		10.47	2	5.34	.89	.42
Error		478.12	81	5.90		
Corrected Total		633.99	87			

Table 8

Two-Factor ANCOVA Predicting Anticipation from Condition and Musical Instrument Use

	Mean	Sum of Squares	df	Mean Square	F	Sig.
Surprise (C)	-	385.80	1	385.80	58.12	<.01
Condition		29.99	2	15.00	2.26	.11
1 – Rock	1.66					
2 – Classical	2.61					
3 – No Music	2.54					
Musical Instrument		15.96	1	15.96	2.41	.13
0 – No	2.14					
1 – Yes	2.45					
Condition X Musical Instrument Interaction		7.18	2	3.59	.54	.58
Error		537.11	81	6.63		
Corrected Total		1045.90	87			

Table 9

Two-Factor ANCOVA Predicting Acceptance from Condition and Musical Instrument Use

	Mean	Sum of Squares	df	Mean Square	F	Sig.
Surprise (C)	-	123.37	1	123.37	24.29	<.01
Condition		.16	2	.08	.02	.98
1 – Rock	1.66					
2 – Classical	2.61					
3 – No Music	2.54					
Musical Instrument		4.29	1	4.29	.85	.36
0 – No	2.14					
1 – Yes	2.45					
Condition X Musical Instrument Interaction		12.13	2	6.07	1.20	.31
Error		411.33	81	5.08		
Corrected Total		566.90	87			

Table 10

Two-Factor ANCOVA Predicting Rejection from Condition and Musical Instrument Use

	Mean	Sum of Squares	df	Mean Square	F	Sig.
Surprise (C)	-	11.82	1	11.82	1.58	.21
Condition		13.11	2	6.55	.88	.42
1 – Rock	1.66					
2 – Classical	2.61					
3 – No Music	2.54					
Musical Instrument		31.72	1	31.72	4.24	.04
0 – No	2.14					
1 – Yes	2.45					
Condition X Musical Instrument Interaction		42.35	2	21.17	2.83	.07
Error		605.68	81	7.48		
Corrected Total		702.63	87			

V. Write-ups of MANOVA and MANCOVA

MANOVA

Four dependent variables were chosen from Neuendorf's Music and Film Experiment dataset, all of which had significant correlations at $p < .01$. The variables are as follows:

E20. The extent you felt content

E21. The extent you felt anticipation

E22. The extent you felt acceptance

E23. The extent you felt rejection

Independent variables chosen were musical condition (1 = Rock music, 2 = Classical Music, 3 = No Music) and if participants played a musical instrument or not. Initially, "musical instrument played" was an opened ended question. It was by-hand coded in the data to either 0 = no instrument played, or 1 = plays an instrument. This resulted in a 2 x 3 factorial design.

Assumptions

Box's M tested for homoscedasticity, which in order to reject the null hypothesis, M should be non-significant. For this set of variables Box's M had a significance of $p = .01$. Due to the fact this is a significant result, the null hypothesis may not be rejected, thus, not confirming the assumption of homogeneity of the variance/covariance matrices across groups.

Multivariate Tests

The multivariate tests in Table 1 indicate that the variable musical instrument had no significant main effect on the set of dependent variables; Pillai's Trace, Wilks' Lambda,

Hotelling's Trace and Roy's Largest Root were all $p = .17$. Music condition had a near significant main effect, with Pillai's Trace $p = .09$, Wilks' Lambda $p = .10$, Hotelling's Trace $p = .10$ and Roy's Largest Root $p = .06$. The interaction effect had a near significant result only with Roy's Largest Root at $p = .10$. With these results we further examined the near significance of the music condition main effect with a series of four ANOVAs. Music condition was significantly related to only one dependent variable, anticipation (E21) $p = .02$, as seen in Table 3. A post-hoc Scheffe test revealed that the "no music" group was near-significantly different from both the "classical" and "rock" groups ($p = .08$).

MANCOVA

One covariate, which was the extent to which one was surprised (E2), was added into the analysis to make the MANOVA a MANCOVA. Meaning that this covariate will operate as a control for the analysis that was previously conducted. This covariate was selected due to the fact that it was highly correlated with three of the four dependent variables, and had near-significance with the fourth, all positively correlated. The addition of this covariate absorbed the significance on the anticipation variable under music condition, moving p from .02 to .11. The rest of the variables remained non-significant. See Table 6 for the omnibus MANCOVA statistics. The covariate was highly significant in the prediction of three of the four dependent variables, as shown in the ANCOVA tables (Table 7 through 10). As may be seen in Tables 7 through 9, the covariate of "surprised" was a significant predictor for the dependent variables of contempt, anticipation, and acceptance.