Hopewell, Sonoyta & Walker, Krista
COM 631/731 Multivariate Statistical Methods
Dr. Kim Neuendorf
Film & TV National Survey dataset (2014) by Jeffres & Neuendorf
MANOVA Class Presentation

I. Model

INDEPENDENT VARIABLES (NOMINAL)   **DEPENDENT VARIABLES** (INTERVAL/RATIO)

Main Effect X1: Gender

Main Effect X2: Q20H (How you prefer watch documentary films)

Interaction between X1 and X2

> **Q29a.** I love the options at my fingertips today, watching videos on my phone, texting, and streaming films.
>
> **Q29s.** I like to see films and TV programs from other countries.
>
> **Q29t.** I see myself as a citizen of the world.

Independent Variables:
Q20H. How you prefer watch documentary films)? – Nominal (5 Categories)
1 = In a theater, 2 = At home on TV/cable, 3= On a mobile device, 4 = Makes no difference where, 5= Don't care to watch
Gender - Nominal (2 Categories)
1= Male, 2= Female
Dependent Variables:
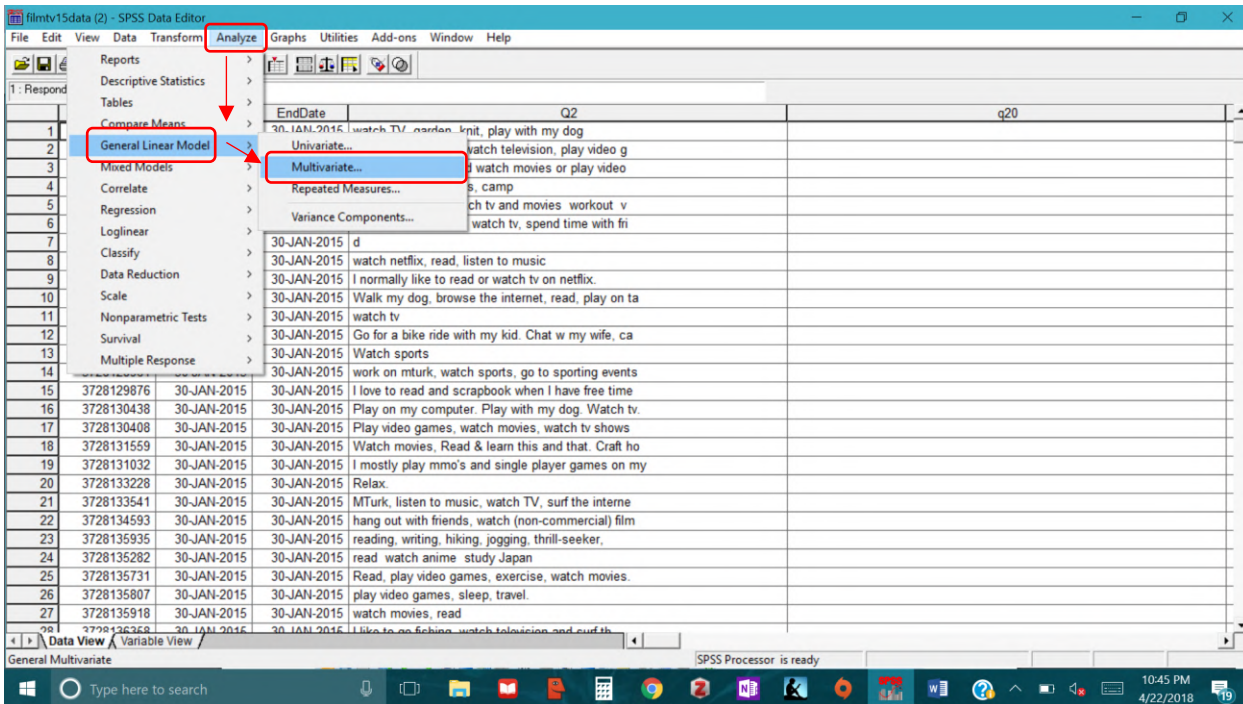(all measured on a 1-7 response scale, where 1=completely disagree and 7=completely agree)
Q29a. I love the options at my fingertips today, watching videos on my phone, texting, streaming films.
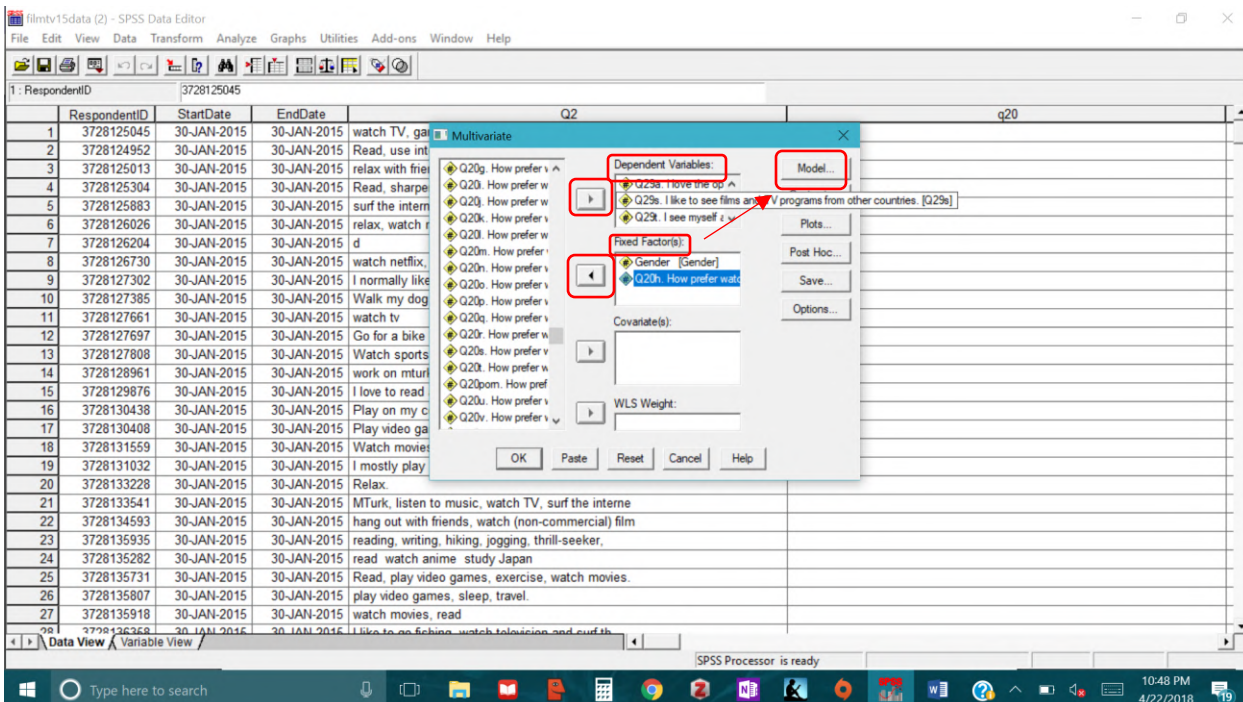Q29s. I like to see films and TV programs from other countries.
Q29t. I see myself as a citizen of the world.

II. Running SPSS

Go to Analyze, General Linear Model, and then Multivariate.

Add the dependent and independent (fixed factor) variables by clicking the appropriate arrows.
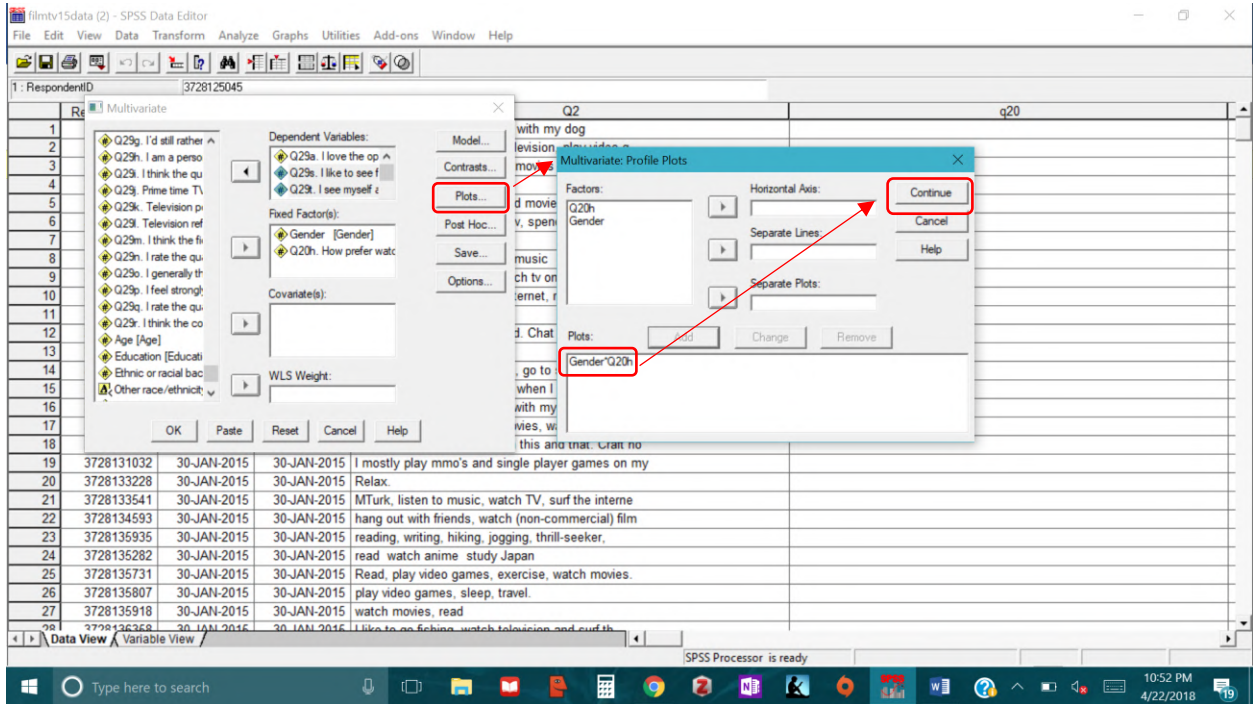
Click Model, check to make sure Full Factorial is chosen. Click continue.

Click Plots, Move the IVs into the right boxes using the arrow keys into Horizontal axis and Separate lines. Click continue.

Once the IVs are in the boxes, check Add to create a graph showing the interaction of the IVs. Click continue.

Click Post Hoc and move any variable that has more than two groups into Post Hoc tests section. Check the boxes for Scheffe, Tukey's B and any other post hoc tests you wish. Click continue.
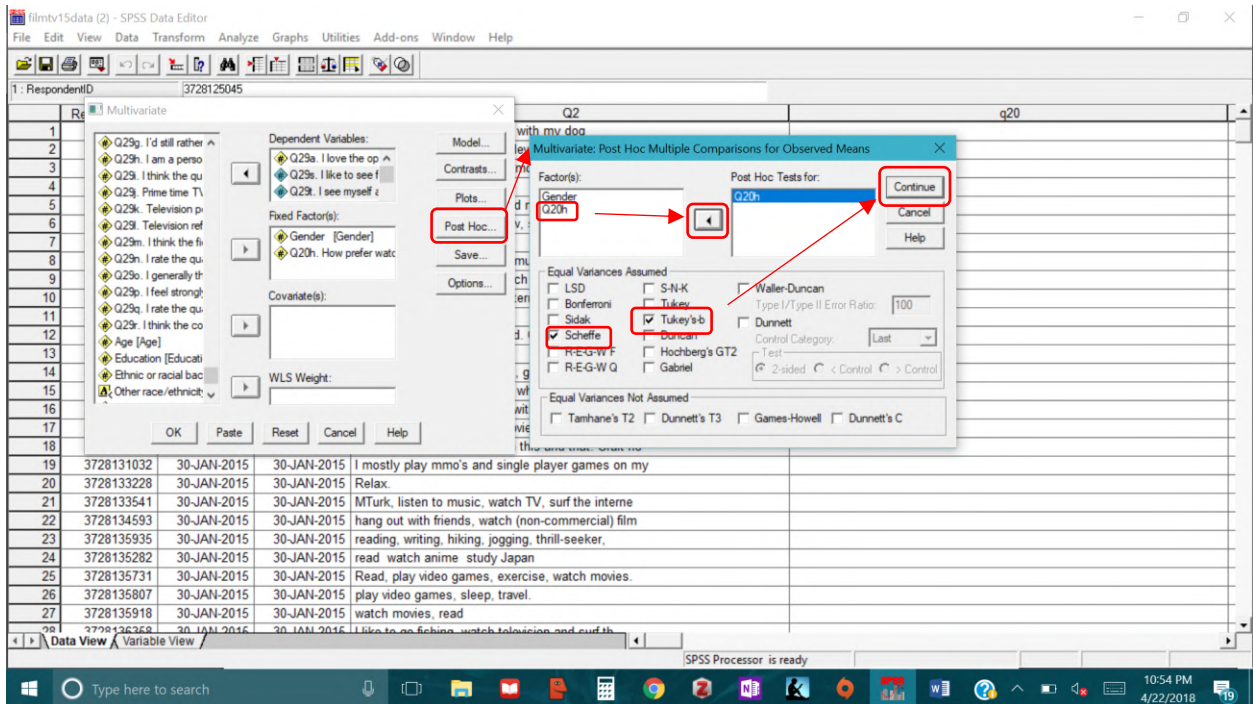
Click Options, highlight all the IVs and the interaction. Use the arrow to move the IVs from the left box to the right. Then look at the Display section and check:

- Descriptive statistics
- Estimates of effect size
- Observed power
- Homogeneity tests

Then click continue.
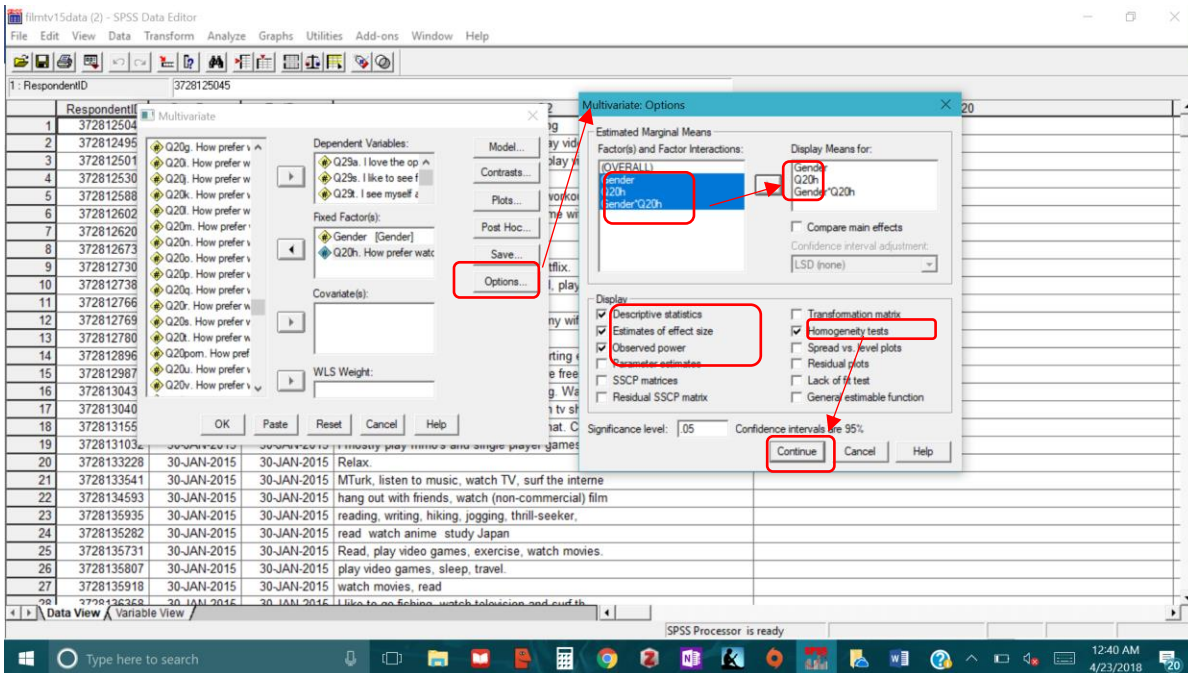
Now click Paste or OK to run your SPSS data!!!
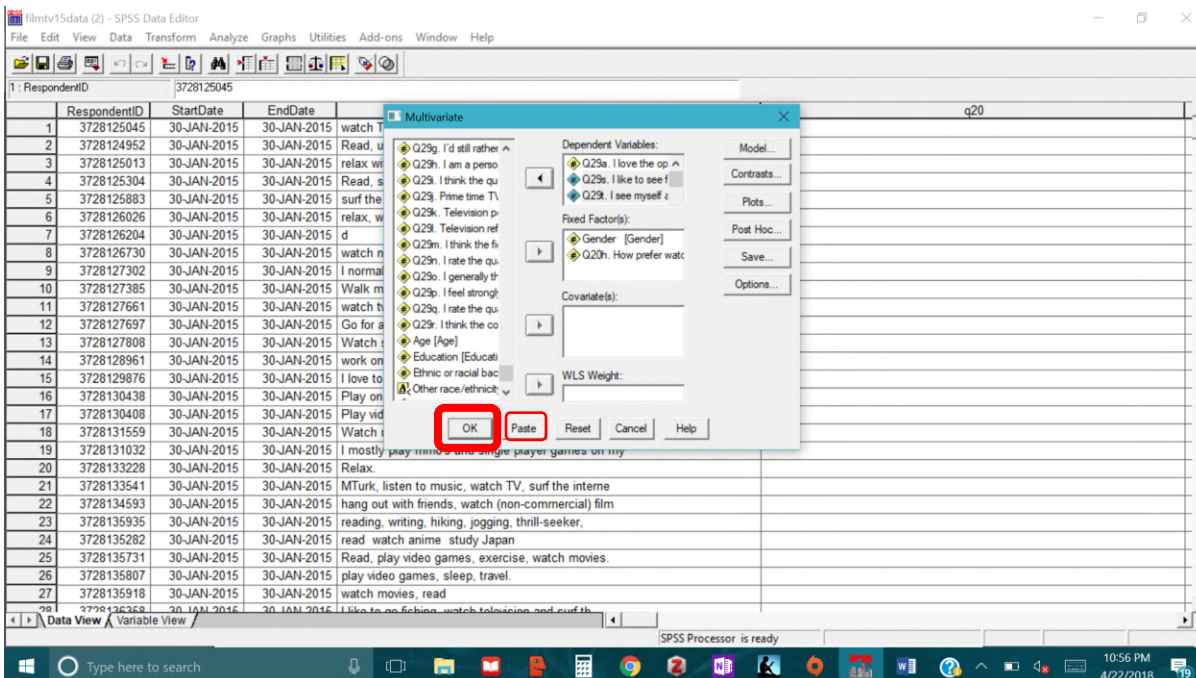
III. SPSS OUTPUT

```
GET

    FILE='E:\Cleveland State University (Graduate School)\COM 631 Multivariate Statistical
                        Methods, Dr. Kim Neuendorf\filmtv15data.sav'.
DATASET NAME DataSet1 WINDOW=FRONT.
DATASET ACTIVATE DataSet1.
CORRELATIONS
  /VARIABLES=Q29a Q29s Q29t
  /PRINT=TWOTAIL NOSIG
  /MISSING=PAIRWISE.
```

Correlations

		Q29a. I love the options at my finger tips today, watching videos on my phone, texting, streaming films.	Q29s. I like to see films and TV programs from other countries.	Q29t. I see myself as a citizen of the world.
Q29a. I love the options at my finger tips today, watching videos on my phone, texting, streaming films.	Pearson Correlation	1	.105[*]	.190[**]
	Sig. (2-tailed)		.045	.000
	N	364	364	364
Q29s. I like to see films and TV programs from other countries.	Pearson Correlation	.105[*]	1	.486[**]
	Sig. (2-tailed)	.045		.000
	N	364	364	364
Q29t. I see myself as a citizen of the world.	Pearson Correlation	.190[**]	.486[**]	1
	Sig. (2-tailed)	.000	.000	
	N	364	364	364

*. Correlation is significant at the 0.05 level (2-tailed).

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

```
GLM Q29a Q29s Q29t BY Gender Q20h
  /METHOD=SSTYPE(3)
  /INTERCEPT=INCLUDE
  /POSTHOC=Q20h(BTUKEY SCHEFFE)
  /PLOT=PROFILE(Gender*Q20h)
  /EMMEANS=TABLES(Gender)
  /EMMEANS=TABLES(Q20h)
  /EMMEANS=TABLES(Gender*Q20h)
  /PRINT=DESCRIPTIVE ETASQ OPOWER HOMOGENEITY
  /CRITERIA=ALPHA(.05)
  /DESIGN= Gender Q20h Gender*Q20h.
```

General Linear Model

Between-Subjects Factors

		Value Label	N
Gender	1	1-Male	141
	2	2-Female	222
Q20h. How prefer watch Documentary films	1	1-Prefer to watch in a theater	17
	2	2-Prefer to watch at home on a TV	194
	3	3-Prefer to watch on a mobile device	15
	4	4-Makes no difference, will watch anywhere	88
	5	5-Don't care to watch anywhere	49

Descriptive Statistics

	Gender		Mean	Std. Deviation	N
Q29a. I love the options at my finger tips today, watching videos on my phone, texting, streaming films.	1-Male	1-Prefer to watch in a theater	5.50	2.236	12
		2-Prefer to watch at home on a TV	4.32	2.107	65
		3-Prefer to watch on a mobile device	5.38	1.506	8
		4-Makes no difference, will watch anywhere	5.73	1.661	37
		5-Don't care to watch anywhere	4.84	2.062	19
		Total	4.92	2.043	141
	2-Female	1-Prefer to watch in a theater	5.20	2.387	5
		2-Prefer to watch at home on a TV	5.03	1.841	129
		3-Prefer to watch on a mobile device	5.86	1.574	7
		4-Makes no difference, will watch anywhere	5.75	1.611	51
		5-Don't care to watch anywhere	5.50	1.815	30
		Total	5.29	1.804	222
	Total	1-Prefer to watch in a theater	5.41	2.210	17
		2-Prefer to watch at home on a TV	4.79	1.958	194
		3-Prefer to watch on a mobile device	5.60	1.502	15
		4-Makes no difference, will watch anywhere	5.74	1.622	88
		5-Don't care to watch anywhere	5.24	1.921	49
		Total	5.15	1.906	363
Q29s. I like to see films and TV programs from other countries.	1-Male	1-Prefer to watch in a theater	4.33	2.229	12
		2-Prefer to watch at home on a TV	4.17	1.884	65
		3-Prefer to watch on a mobile device	5.63	1.408	8
		4-Makes no difference, will watch anywhere	4.65	1.736	37
		5-Don't care to watch anywhere	3.53	1.837	19
		Total	4.30	1.882	141
	2-Female	1-Prefer to watch in a theater	4.40	2.074	5
		2-Prefer to watch at home on a TV	3.74	2.025	129
		3-Prefer to watch on a mobile device	4.57	1.512	7
		4-Makes no difference, will watch anywhere	4.67	1.925	51
		5-Don't care to watch anywhere	3.63	2.189	30
		Total	3.98	2.039	222
	Total	1-Prefer to watch in a theater	4.35	2.120	17
		2-Prefer to watch at home on a TV	3.88	1.985	194
		3-Prefer to watch on a mobile device	5.13	1.506	15
		4-Makes no difference, will watch anywhere	4.66	1.838	88
		5-Don't care to watch anywhere	3.59	2.040	49
		Total	4.10	1.983	363
Q29t. I see myself as a citizen of the world.	1-Male	1-Prefer to watch in a theater	5.00	2.663	12
		2-Prefer to watch at home on a TV	4.55	1.786	65
		3-Prefer to watch on a mobile device	5.50	1.512	8
		4-Makes no difference, will watch anywhere	5.11	1.629	37
		5-Don't care to watch anywhere	4.00	2.082	19
		Total	4.72	1.880	141
	2-Female	1-Prefer to watch in a theater	6.60	.548	5
		2-Prefer to watch at home on a TV	4.45	1.900	129
		3-Prefer to watch on a mobile device	5.14	.900	7
		4-Makes no difference, will watch anywhere	5.08	1.719	51
		5-Don't care to watch anywhere	4.37	1.629	30
		Total	4.65	1.818	222
	Total	1-Prefer to watch in a theater	5.47	2.348	17
		2-Prefer to watch at home on a TV	4.48	1.858	194
		3-Prefer to watch on a mobile device	5.33	1.234	15
		4-Makes no difference, will watch anywhere	5.09	1.672	88
		5-Don't care to watch anywhere	4.22	1.806	49
		Total	4.68	1.840	363

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

Box's M	62.923
F	1.036
df1	54
df2	4113.945
Sig.	.402

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

a. Design: Intercept + Gender + Q20h + Gender * Q20h

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[d]
Intercept	Pillai's Trace	.853	677.568[b]	3.000	351.000	.000	.853	2032.705	1.000
	Wilks' Lambda	.147	677.568[b]	3.000	351.000	.000	.853	2032.705	1.000
	Hotelling's Trace	5.791	677.568[b]	3.000	351.000	.000	.853	2032.705	1.000
	Roy's Largest Root	5.791	677.568[b]	3.000	351.000	.000	.853	2032.705	1.000
Gender	Pillai's Trace	.010	1.212[b]	3.000	351.000	.305	.010	3.637	.325
	Wilks' Lambda	.990	1.212[b]	3.000	351.000	.305	.010	3.637	.325
	Hotelling's Trace	.010	1.212[b]	3.000	351.000	.305	.010	3.637	.325
	Roy's Largest Root	.010	1.212[b]	3.000	351.000	.305	.010	3.637	.325
Q20h	Pillai's Trace	.109	3.322	12.000	1059.000	.000	.036	39.868	.997
	Wilks' Lambda	.894	3.363	12.000	928.950	.000	.037	35.504	.992
	Hotelling's Trace	.116	3.392	12.000	1049.000	.000	.037	40.701	.997
	Roy's Largest Root	.088	7.758[c]	4.000	353.000	.000	.081	31.033	.998
Gender * Q20h	Pillai's Trace	.024	.706	12.000	1059.000	.747	.008	8.473	.422
	Wilks' Lambda	.976	.704	12.000	928.950	.749	.008	7.445	.368
	Hotelling's Trace	.024	.702	12.000	1049.000	.751	.008	8.421	.419
	Roy's Largest Root	.015	1.330[c]	4.000	353.000	.258	.015	5.320	.415

a. Design: Intercept + Gender + Q20h + Gender * Q20h
b. Exact statistic
c. The statistic is an upper bound on F that yields a lower bound on the significance level.
d. Computed using alpha = .05

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

	F	df1	df2	Sig.
Q29a. I love the options at my finger tips today, watching videos on my phone, texting, streaming films.	1.294	9	353	.238
Q29s. I like to see films and TV programs from other countries.	1.233	9	353	.273
Q29t. I see myself as a citizen of the world.	2.978	9	353	.002

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.
a. Design: Intercept + Gender + Q20h + Gender * Q20h

Tests of Between-Subjects Effects

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[d]
Corrected Model	Q29a. I love the options at my finger tips today, watching videos on my phone, texting, streaming films.	87.628[a]	9	9.736	2.800	.003	.067	25.197	.959
	Q29s. I like to see films and TV programs from other countries.	78.920[b]	9	8.769	2.301	.016	.055	20.711	.907
	Q29t. I see myself as a citizen of the world.	61.028[c]	9	6.781	2.056	.033	.050	18.503	.865
Intercept	Q29a. I love the options at my finger tips today, watching videos on my phone, texting, streaming films.	3989.021	1	3989.021	1147.023	.000	.765	1147.023	1.000
	Q29s. I like to see films and TV programs from other countries.	2653.443	1	2653.443	696.352	.000	.664	696.352	1.000
	Q29t. I see myself as a citizen of the world.	3508.132	1	3508.132	1063.653	.000	.751	1063.653	1.000
Gender	Q29a. I love the options at my finger tips today, watching videos on my phone, texting, streaming films.	3.457	1	3.457	.994	.319	.003	.994	.169
	Q29s. I like to see films and TV programs from other countries.	2.371	1	2.371	.622	.431	.002	.622	.123
	Q29t. I see myself as a citizen of the world.	3.080	1	3.080	.934	.335	.003	.934	.161
Q20h	Q29a. I love the options at my finger tips today, watching videos on my phone, texting, streaming films.	70.826	4	17.707	5.091	.001	.055	20.366	.965
	Q29s. I like to see films and TV programs from other countries.	58.043	4	14.511	3.808	.005	.041	15.232	.892
	Q29t. I see myself as a citizen of the world.	55.332	4	13.833	4.194	.002	.045	16.777	.922
Gender * Q20h	Q29a. I love the options at my finger tips today, watching videos on my phone, texting, streaming films.	9.383	4	2.346	.674	.610	.008	2.698	.219
	Q29s. I like to see films and TV programs from other countries.	7.232	4	1.808	.474	.754	.005	1.898	.163
	Q29t. I see myself as a citizen of the world.	11.422	4	2.856	.866	.485	.010	3.463	.276
Error	Q29a. I love the options at my finger tips today, watching videos on my phone, texting, streaming films.	1227.633	353	3.478					
	Q29s. I like to see films and TV programs from other countries.	1345.102	353	3.810					
	Q29t. I see myself as a citizen of the world.	1164.262	353	3.298					
Total	Q29a. I love the options at my finger tips today, watching videos on my phone, texting, streaming films.	10928.000	363						
	Q29s. I like to see films and TV programs from other countries.	7540.000	363						
	Q29t. I see myself as a citizen of the world.	9168.000	363						
Corrected Total	Q29a. I love the options at my finger tips today, watching videos on my phone, texting, streaming films.	1315.262	362						
	Q29s. I like to see films and TV programs from other countries.	1424.022	362						
	Q29t. I see myself as a citizen of the world.	1225.289	362						

a. R Squared = .067 (Adjusted R Squared = .043)
b. R Squared = .055 (Adjusted R Squared = .031)
c. R Squared = .050 (Adjusted R Squared = .026)
d. Computed using alpha = .05

Estimated Marginal Means

1. Gender

Dependent Variable		Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Q29a. I love the options at my finger	1-Male	5.154	.205	4.750	5.558
	2-Female	5.467	.237	5.001	5.933
Q29s. I like to see films and TV	1-Male	4.461	.215	4.038	4.883
	2-Female	4.202	.248	3.714	4.689
Q29t. I see myself as a citizen of the	1-Male	4.832	.200	4.439	5.226
	2-Female	5.128	.231	4.674	5.581

2. Q20h. How prefer watch Documentary films

Dependent Variable		Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Q29a. I love the options at my finger tips today, watching videos on my phone, texting, streaming films.	1-Prefer to watch in a theater	5.350	.496	4.374	6.326
	2-Prefer to watch at home on a TV	4.677	.142	4.398	4.956
	3-Prefer to watch on a mobile device	5.616	.483	4.667	6.565
	4-Makes no difference, will watch anywhere	5.737	.201	5.341	6.133
	5-Don't care to watch anywhere	5.171	.273	4.633	5.709
Q29s. I like to see films and TV programs from other countries.	1-Prefer to watch in a theater	4.367	.520	3.345	5.388
	2-Prefer to watch at home on a TV	3.953	.148	3.661	4.245
	3-Prefer to watch on a mobile device	5.098	.505	4.105	6.092
	4-Makes no difference, will watch anywhere	4.658	.211	4.243	5.072
	5-Don't care to watch anywhere	3.580	.286	3.017	4.143
Q29t. I see myself as a citizen of the world.	1-Prefer to watch in a theater	5.800	.483	4.849	6.751
	2-Prefer to watch at home on a TV	4.502	.138	4.230	4.773
	3-Prefer to watch on a mobile device	5.321	.470	4.397	6.246
	4-Makes no difference, will watch anywhere	5.093	.196	4.708	5.479
	5-Don't care to watch anywhere	4.183	.266	3.660	4.707

3. Gender * Q20h. How prefer watch Documentary films

Dependent Variable			Mean	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
Q29a. I love the options at my finger tips today, watching videos on my phone, texting, streaming films.	1-Male	1-Prefer to watch in a theater	5.500	.538	4.441	6.559
		2-Prefer to watch at home on a TV	4.323	.231	3.868	4.778
		3-Prefer to watch on a mobile device	5.375	.659	4.078	6.672
		4-Makes no difference, will watch anywhere	5.730	.307	5.127	6.333
		5-Don't care to watch anywhere	4.842	.428	4.001	5.684
	2-Female	1-Prefer to watch in a theater	5.200	.834	3.560	6.840
		2-Prefer to watch at home on a TV	5.031	.164	4.708	5.354
		3-Prefer to watch on a mobile device	5.857	.705	4.471	7.243
		4-Makes no difference, will watch anywhere	5.745	.261	5.232	6.259
		5-Don't care to watch anywhere	5.500	.340	4.830	6.170
Q29s. I like to see films and TV programs from other countries.	1-Male	1-Prefer to watch in a theater	4.333	.564	3.225	5.442
		2-Prefer to watch at home on a TV	4.169	.242	3.693	4.645
		3-Prefer to watch on a mobile device	5.625	.690	4.268	6.982
		4-Makes no difference, will watch anywhere	4.649	.321	4.018	5.280
		5-Don't care to watch anywhere	3.526	.448	2.646	4.407
	2-Female	1-Prefer to watch in a theater	4.400	.873	2.683	6.117
		2-Prefer to watch at home on a TV	3.736	.172	3.398	4.074
		3-Prefer to watch on a mobile device	4.571	.738	3.120	6.022
		4-Makes no difference, will watch anywhere	4.667	.273	4.129	5.204
		5-Don't care to watch anywhere	3.633	.356	2.932	4.334
Q29t. I see myself as a citizen of the world.	1-Male	1-Prefer to watch in a theater	5.000	.524	3.969	6.031
		2-Prefer to watch at home on a TV	4.554	.225	4.111	4.997
		3-Prefer to watch on a mobile device	5.500	.642	4.237	6.763
		4-Makes no difference, will watch anywhere	5.108	.299	4.521	5.695
		5-Don't care to watch anywhere	4.000	.417	3.181	4.819
	2-Female	1-Prefer to watch in a theater	6.600	.812	5.003	8.197
		2-Prefer to watch at home on a TV	4.450	.160	4.135	4.764
		3-Prefer to watch on a mobile device	5.143	.686	3.793	6.493
		4-Makes no difference, will watch anywhere	5.078	.254	4.578	5.579
		5-Don't care to watch anywhere	4.367	.332	3.715	5.019

Post Hoc Tests

Q20h. How prefer watch Documentary films

Multiple Comparisons

Dependent Variable			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Lower Bound	Upper Bound
Q29a. I love the options at my finger tips today, watching videos on my phone, texting, streaming films.	Scheffe	1-Prefer to watch in a theater	2-Prefer to watch at home on a TV	.62	.472	.788	-.84	2.08
			3-Prefer to watch on a mobile device	-.19	.661	.999	-2.23	1.86
			4-Makes no difference, will watch anywhere	-.33	.494	.979	-1.86	1.20
			5-Don't care to watch anywhere	.17	.525	.999	-1.46	1.79
		2-Prefer to watch at home on a TV	1-Prefer to watch in a theater	-.62	.472	.788	-2.08	.84
			3-Prefer to watch on a mobile device	-.81	.500	.627	-2.35	.74
			4-Makes no difference, will watch anywhere	-.94*	.240	.004	-1.69	-.20
			5-Don't care to watch anywhere	-.45	.298	.683	-1.37	.47
		3-Prefer to watch on a mobile device	1-Prefer to watch in a theater	.19	.661	.999	-1.86	2.23
			2-Prefer to watch at home on a TV	.81	.500	.627	-.74	2.35
			4-Makes no difference, will watch anywhere	-.14	.521	.999	-1.75	1.47
			5-Don't care to watch anywhere	.36	.550	.981	-1.35	2.06
		4-Makes no difference, will watch anywhere	1-Prefer to watch in a theater	.33	.494	.979	-1.20	1.86
			2-Prefer to watch at home on a TV	.94*	.240	.004	.20	1.69
			3-Prefer to watch on a mobile device	.14	.521	.999	-1.47	1.75
			5-Don't care to watch anywhere	.49	.332	.698	-.54	1.52
		5-Don't care to watch anywhere	1-Prefer to watch in a theater	-.17	.525	.999	-1.79	1.46
			2-Prefer to watch at home on a TV	.45	.298	.683	-.47	1.37
			3-Prefer to watch on a mobile device	-.36	.550	.981	-2.06	1.35
			4-Makes no difference, will watch anywhere	-.49	.332	.698	-1.52	.54
Q29s. I like to see films and TV programs from other countries.	Scheffe	1-Prefer to watch in a theater	2-Prefer to watch at home on a TV	.47	.494	.923	-1.06	2.00
			3-Prefer to watch on a mobile device	-.78	.692	.866	-2.92	1.36
			4-Makes no difference, will watch anywhere	-.31	.517	.986	-1.91	1.30
			5-Don't care to watch anywhere	.76	.549	.751	-.94	2.46
		2-Prefer to watch at home on a TV	1-Prefer to watch in a theater	-.47	.494	.923	-2.00	1.06
			3-Prefer to watch on a mobile device	-1.25	.523	.223	-2.87	.37
			4-Makes no difference, will watch anywhere	-.78*	.251	.050	-1.55	.00
			5-Don't care to watch anywhere	.29	.312	.930	-.68	1.26
		3-Prefer to watch on a mobile device	1-Prefer to watch in a theater	.78	.692	.866	-1.36	2.92
			2-Prefer to watch at home on a TV	1.25	.523	.223	-.37	2.87
			4-Makes no difference, will watch anywhere	.47	.545	.944	-1.21	2.16
			5-Don't care to watch anywhere	1.54	.576	.130	-.24	3.33
		4-Makes no difference, will watch anywhere	1-Prefer to watch in a theater	.31	.517	.986	-1.30	1.91
			2-Prefer to watch at home on a TV	.78*	.251	.050	.00	1.55
			3-Prefer to watch on a mobile device	-.47	.545	.944	-2.16	1.21
			5-Don't care to watch anywhere	1.07	.348	.054	-.01	2.14
		5-Don't care to watch anywhere	1-Prefer to watch in a theater	-.76	.549	.751	-2.46	.94
			2-Prefer to watch at home on a TV	-.29	.312	.930	-1.26	.68
			3-Prefer to watch on a mobile device	-1.54	.576	.130	-3.33	.24
			4-Makes no difference, will watch anywhere	-1.07	.348	.054	-2.14	.01
Q29t. I see myself as a citizen of the world.	Scheffe	1-Prefer to watch in a theater	2-Prefer to watch at home on a TV	.99	.459	.332	-.44	2.41
			3-Prefer to watch on a mobile device	.14	.643	1.000	-1.85	2.13
			4-Makes no difference, will watch anywhere	.38	.481	.960	-1.11	1.87
			5-Don't care to watch anywhere	1.25	.511	.206	-.34	2.83
		2-Prefer to watch at home on a TV	1-Prefer to watch in a theater	-.99	.459	.332	-2.41	.44
			3-Prefer to watch on a mobile device	-.85	.487	.552	-2.36	.66
			4-Makes no difference, will watch anywhere	-.61	.233	.152	-1.33	.12
			5-Don't care to watch anywhere	.26	.290	.938	-.64	1.16
		3-Prefer to watch on a mobile device	1-Prefer to watch in a theater	-.14	.643	1.000	-2.13	1.85
			2-Prefer to watch at home on a TV	.85	.487	.552	-.66	2.36
			4-Makes no difference, will watch anywhere	.24	.507	.994	-1.33	1.81
			5-Don't care to watch anywhere	1.11	.536	.371	-.55	2.77
		4-Makes no difference, will watch anywhere	1-Prefer to watch in a theater	-.38	.481	.960	-1.87	1.11
			2-Prefer to watch at home on a TV	.61	.233	.152	-.12	1.33
			3-Prefer to watch on a mobile device	-.24	.507	.994	-1.81	1.33
			5-Don't care to watch anywhere	.87	.324	.130	-.14	1.87
		5-Don't care to watch anywhere	1-Prefer to watch in a theater	-1.25	.511	.206	-2.83	.34
			2-Prefer to watch at home on a TV	-.26	.290	.938	-1.16	.64
			3-Prefer to watch on a mobile device	-1.11	.536	.371	-2.77	.55
			4-Makes no difference, will watch anywhere	-.87	.324	.130	-1.87	.14

Based on observed means.
 The error term is Mean Square(Error) = 3.298.
*. The mean difference is significant at the .05 level.

Homogeneous Subsets

Q29a. I love the options at my finger tips today, watching videos on my phone, texting, streaming films.

Q20h. How prefer watch Documentary films		N	Subset
Tukey B[a,b,c]	2-Prefer to watch at home on a TV	194	4.79
	5-Don't care to watch anywhere	49	5.24
	1-Prefer to watch in a theater	17	5.41
	3-Prefer to watch on a mobile device	15	5.60
	4-Makes no difference, will watch anywhere	88	5.74
Scheffe[a,b,c]	2-Prefer to watch at home on a TV	194	4.79
	5-Don't care to watch anywhere	49	5.24
	1-Prefer to watch in a theater	17	5.41
	3-Prefer to watch on a mobile device	15	5.60
	4-Makes no difference, will watch anywhere	88	5.74
	Sig.		.414

Means for groups in homogeneous subsets are displayed.
 Based on observed means.
 The error term is Mean Square(Error) = 3.478.

a. Uses Harmonic Mean Sample Size = 30.785.

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.

Q29s. I like to see films and TV programs from other countries.

Q20h. How prefer watch Documentary films		N	Subset	
Tukey B[a,b,c]	5-Don't care to watch anywhere	49	3.59	
	2-Prefer to watch at home on a TV	194	3.88	3.88
	1-Prefer to watch in a theater	17	4.35	4.35
	4-Makes no difference, will watch anywhere	88	4.66	4.66
	3-Prefer to watch on a mobile device	15		5.13
Scheffe[a,b,c]	5-Don't care to watch anywhere	49	3.59	
	2-Prefer to watch at home on a TV	194	3.88	3.88
	1-Prefer to watch in a theater	17	4.35	4.35
	4-Makes no difference, will watch anywhere	88	4.66	4.66
	3-Prefer to watch on a mobile device	15		5.13
	Sig.		.333	.178

Means for groups in homogeneous subsets are displayed.
 Based on observed means.
 The error term is Mean Square(Error) = 3.810.

a. Uses Harmonic Mean Sample Size = 30.785.

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.

Q29t. I see myself as a citizen of the world.

Q20h. How prefer watch Documentary films		N	Subset
Tukey B[a,b,c]	5-Don't care to watch anywhere	49	4.22
	2-Prefer to watch at home on a TV	194	4.48
	4-Makes no difference, will watch anywhere	88	5.09
	3-Prefer to watch on a mobile device	15	5.33
	1-Prefer to watch in a theater	17	5.47
Scheffe[a,b,c]	5-Don't care to watch anywhere	49	4.22
	2-Prefer to watch at home on a TV	194	4.48
	4-Makes no difference, will watch anywhere	88	5.09
	3-Prefer to watch on a mobile device	15	5.33
	1-Prefer to watch in a theater	17	5.47
	Sig.		.126

Means for groups in homogeneous subsets are displayed.
 Based on observed means.
 The error term is Mean Square(Error) = 3.298.

a. Uses Harmonic Mean Sample Size = 30.785.

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.

Profile Plots

Q29a. I love the options at my finger tips today, watching videos on my phone, texting, streaming films.

Estimated Marginal Means of Q29a. I love the options at my finger tips today, watching videos on my phone, texting, streaming films.
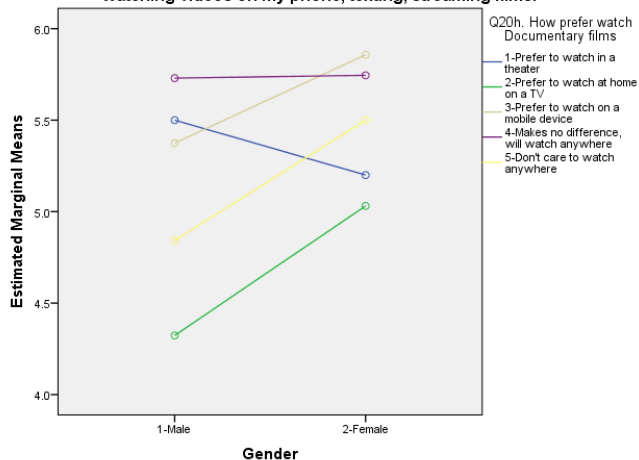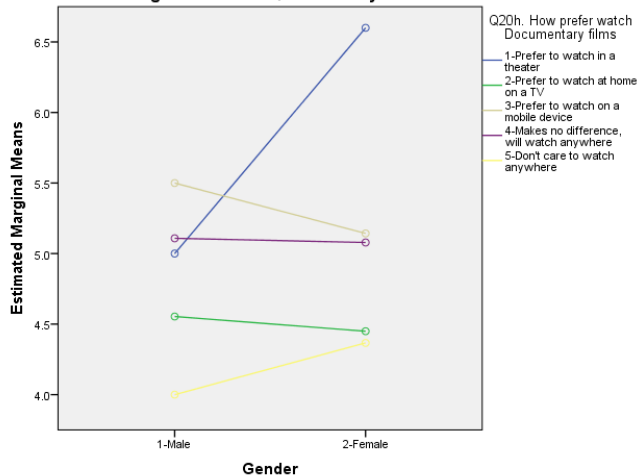
Q29s. I like to see films and TV programs from other countries.

Estimated Marginal Means of Q29s. I like to see films and TV programs from other countries.
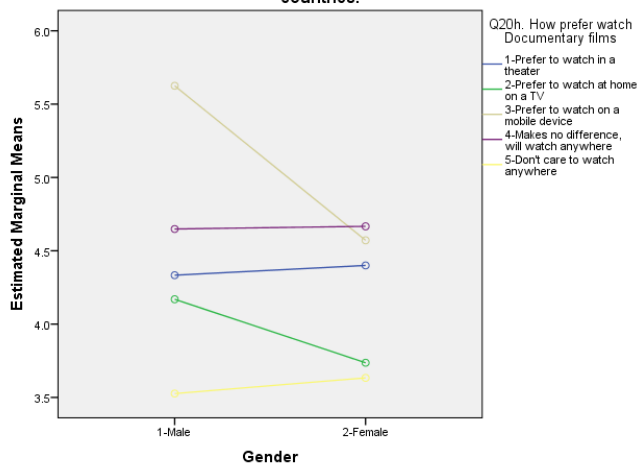
Q29t. I see myself as a citizen of the world.

Estimated Marginal Means of Q29t. I see myself as a citizen of the world.

IV. TABLING RESULTS

Table #1: Multivariate Statistics for MANOVA (OVERALL)

Effect		Value	F- Value	Sig.	Observed Power[d]
Main Effect: Gender	Pillai's Trace	.010	1.212[b]	.305	.325
	Wilks' Lambda	.990	1.212[b]	.305	.325
	Hotelling's Trace	.010	1.212[b]	.305	.325
	Roy's Largest Root	.010	1.212[b]	.305	.325
Main Effect: Q20h- How prefer watch Documentary films	Pillai's Trace	.109	3.322	.000	.997
	Wilks' Lambda	.894	3.363	.000	.992
	Hotelling's Trace	.116	3.392	.000	.997
	Roy's Largest Root	.088	7.758[c]	.000	.998
Interaction: Gender * Q20h- Pref. watching Docs films	Pillai's Trace	.024	.706	.747	.422
	Wilks' Lambda	.976	.704	.749	.368
	Hotelling's Trace	.024	.702	.751	.419
	Roy's Largest Root	.015	1.330[c]	.258	.415

a. Design: Intercept + Gender + Q20h + Gender * Q20h
b. Exact statistic
c. The statistic is an upper bound on F that yields a lower bound on the significance level.
d. Computed using alpha = .05

Table 2. Two-factor ANOVA predicting Q29a. "I love the options at my finger tips today, watching videos on my phone, texting, streaming films." from Gender and Q20h. "How prefer watch Documentary films."

Source		Mean	*n*	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Main Effect: Gender				3.457	1	3.457	.994	.319	.003
	2- Female	5.29	222						
	1- Male	4.92	141						
Main Effect: Q20h--Preference in watching Docs				70.826	4	17.707	5.091	.001	.055
	1-Prefer in a theater	5.41	17						
	2-Prefer home on TV	4.79	194						
	3-Prefer on mobile dvc	5.60	15						
	4-No Diff; watch anywhere	5.74	88						
	5-Don't care to watch	5.24	49						
Interaction: Gender * Q20h--Prefer. in watching Docs				9.383	4	2.346	.674	.610	.008
Error				1227.633	353	3.478			

Table 3. Two-factor ANOVA predicting Q29s. "I like to see films and TV programs from other countries." from Gender and Q20h. "How prefer watch Documentary films."

Source		Mean	*n*	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Main Effect: Gender				2.371	1	2.371	.622	.431	.002
	2- Female	3.98	222						
	1- Male	4.30	141						
Main Effect: Q20h--Preference in watching Docs				58.043	4	14.511	3.808	.005	.041
	1-Prefer in a theater	4.35	17						
	2-Prefer home on TV	3.88	194						
	3-Prefer on mobile dvc	5.13	15						
	4-No Diff; watch anyw	4.66	88						
	5-Don't care -anywhere	3.59	49						
Interaction: Gender * Q20h--Prefer. in watching Docs				7.232	4	1.808	.474	.754	.005
Error				1345.102	353	3.810			

Table 4. Two-factor ANOVA predicting Q29t. "I see myself as a citizen of the world." from Gender and Q20h. "How prefer watch Documentary films."

Source		Mean	*n*	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Main Effect: Gender				3.080	1	3.080	.934	.335	.003
	2- Female	4.65	222						
	1- Male	4.72	141						
Main Effect: Q20h--Preference in watching Docs				55.332	4	13.833	4.194	.002	.045
	1-Prefer in a theater	5.47	17						
	2-Prefer home on TV	4.48	194						
	3-Prefer on mobile dvc	5.33	15						
	4-No Diff; watch anyw	5.09	88						
	5-Don't care -anywhere	4.22	49						
Interaction: Gender * Q20h-- Prefer. in watching Docs				11.422	4	2.856	0.866	.485	.010
Error				1164.262	353	3.298			

V. Write up -MANOVA

From the Jeffres and Neuendorf (2015) data on Film and TV usage national survey, we selected these variables after seeing that they had significant intercorrelations of $p < .05$:

- Q29a. "I love the options at my fingertips today, watching videos on my phone, texting, streaming films."

- Q29s. "I like to see films and TV programs from other countries."

- Q29t. "I see myself as a citizen of the world."

Each variable has a response scale of 1-7, 1 being "completely disagree" and 7 being "completely agree". These three variables were tested against the independent variables of gender and Q20h, "how you prefer to watch documentary films." This resulted in a 2 x 5 factorial design.

Assumptions

Box's M tested for homoscedasticity, which specifically tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups. It is ideal for M to be non-significant. For this set of variable, Box's M was not significant, $p = .402$.

Multivariate Tests

The multivariate tests in Table 1 indicate that both the main effect of gender and the interaction of Q20h and gender have no significant effect on the dependent variables. Table 1 does show that Q20h has a significant main effect with Pillai's Trace, Wilks' Lambda, Hotelling's Trace and Roy's Largest Root as each having a significance of $p < .001$. A series of three ANOVAs was conducted to further examine of the three dependent variables independently.

ANOVAs

Table 2 shows the ANOVA predicting Q29a, "I love the options at my fingertips today, watching videos on my phone, texting, streaming films." The table indicates that the main effect of Q20h, "How you prefer watching documentary films," is significant at p = .001. The means of the five groups differ significantly, with the "prefer [to watch documentaries] at home on TV" group the lowest (M = 4.79) and the "will watch [documentaries] anywhere" group the highest (M = 5.74).

Table 3 shows the ANOVA predicting Q29s, "I like to see films and TV programs from other countries." The table indicates that the main effect of Q20h, "How you prefer watching documentary films," is significant at p = .005. The means of the five groups differ significantly, with the "don't watch [documentaries] anywhere" group the lowest (M = 3.88) and the "prefer [to watch documentaries] on a mobile device" group the highest (M = 5.13).

Table 4 shows the ANOVA predicting Q29t, "I see myself as a citizen of the world." The table indicates that the main effect of Q20h, "How you prefer watching documentary films," is significant at p = .002. The means of the five groups differ significantly, with the "don't watch [documentaries] anywhere" group the lowest (M = 4.22) and the "prefer [to watch documentaries] in a theater" group the highest (M = 5.47).