

Discriminant Analysis

COM 631

Kyle Fee

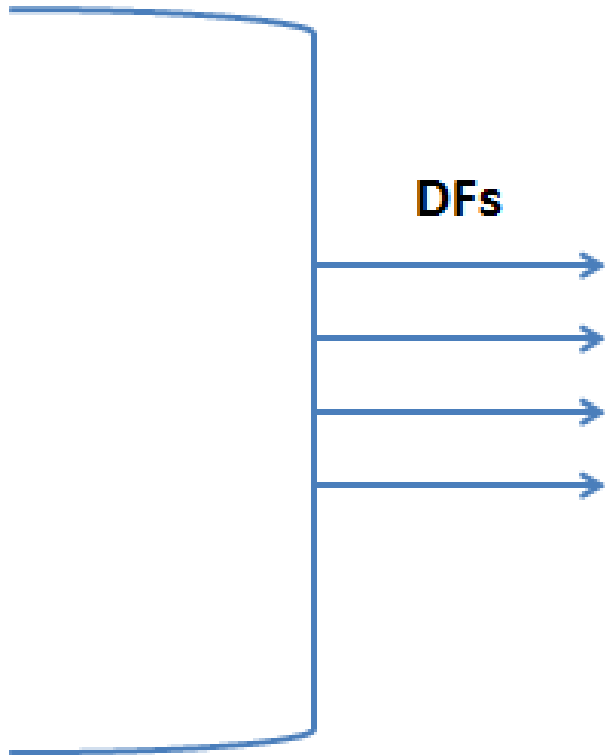
Marlin Linger

I. Model

Dataset: Humor and Public Opinion (Neuendorf and Skalski, 2010)

Independent Variables:

- B1
- B2
- B3
- B6
- B7
- B8
- B9
- B10
- B12
- B20
- G1
- G3
- Nonwhite
- G9



Dependent Variable:

Political leaning

- Strong conservative
- Leans toward conservative
- Middle of the road
- Leans toward liberal
- Strong liberal

Key:

The following variables have response options ranging from 0 (strongly disagree) to 10 (strongly agree)

B1: Barack Obama is doing a good job as president

B2: I believe that OJ Simpson is innocent of murder

B3: Affirmative action is still necessary to help minorities and other groups

B6: Abortion should remain legal

B7: All human cloning should be banned

B8: I favor the death penalty for a person convicted of murder

B9: Marriages between same-sex couples should be recognized by the law as valid, with the same rights as traditional marriages

B10: The laws covering the sale of firearms should be made stricter

B12: The US healthcare system today is in a state of crisis

The following variable has response options ranging from 0 (too little) to 10 (too much)

B20: In general, do you think there is too much or too little government regulation of business and industry?

G1: Are you male or female? (1-male, 2-female)- **RECODED to SEX** (0-male, 1-female)

G3: What is your marital status? (1-married, 2-seperated/divorced, 3-widowed, 4-never been married, in a relationship, 5-never been married, not in a relationship)- **RECODED to MARRIED** (0-not married, 1-married)

```
GET
  FILE='H:\kyle\grad school\multivariate stats\discriminant\humor.sav'.
RECODE G1 (1=0) (2=1) INTO SEX.
VARIABLE LABELS  SEX '0-male; 1-female'.
EXECUTE.
RECODE G3 (1=1) (2=0) (3=0) (4=0) (5=0) INTO married.
VARIABLE LABELS  married '(0-not married, 1-married) '.
EXECUTE.
```

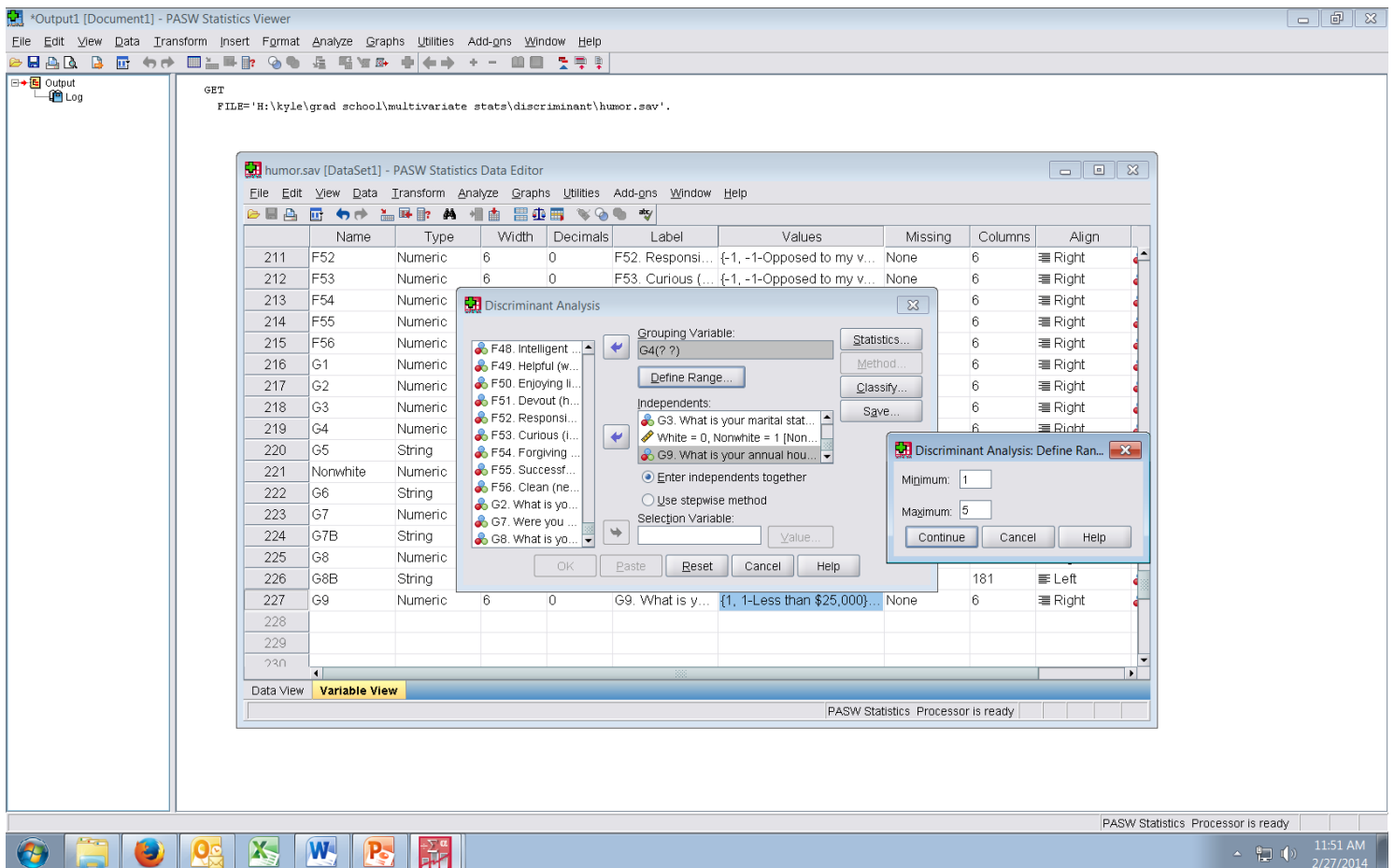
Nonwhite: (0=white, 1=nonwhite)

G9: What is your annual household income? (1-less than \$25K, 2-\$25K to \$49K, 3- \$50K to \$75K, 4-\$75K to \$100K, 5- \$100K to \$150K, 6- greater than \$150K)

II. Running SPSS

Analyze => Classify => Discriminant

- Place your dependent variable (DV) into the box labeled “grouping variable” by clicking the arrow
- The “Define Range” button is used to enter in the minimum and maximum values for your DV (this case 1 to 5), click continue after
- Place your independent variable (IV) into the box labeled “independent” by clicking the arrow
- click/check the box next to “enter independents together” (not stepwise)

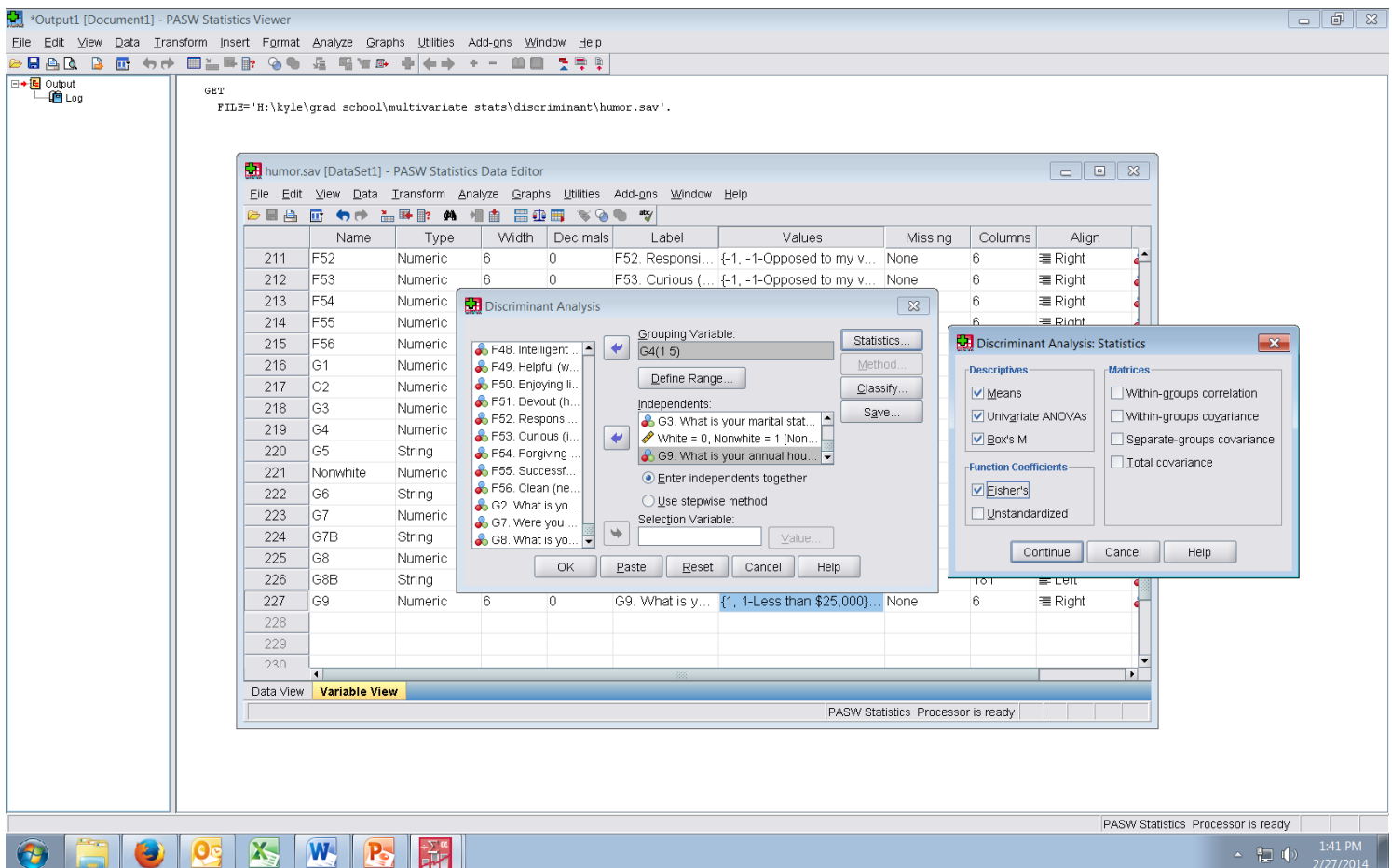


-Click on the “Statistics” button

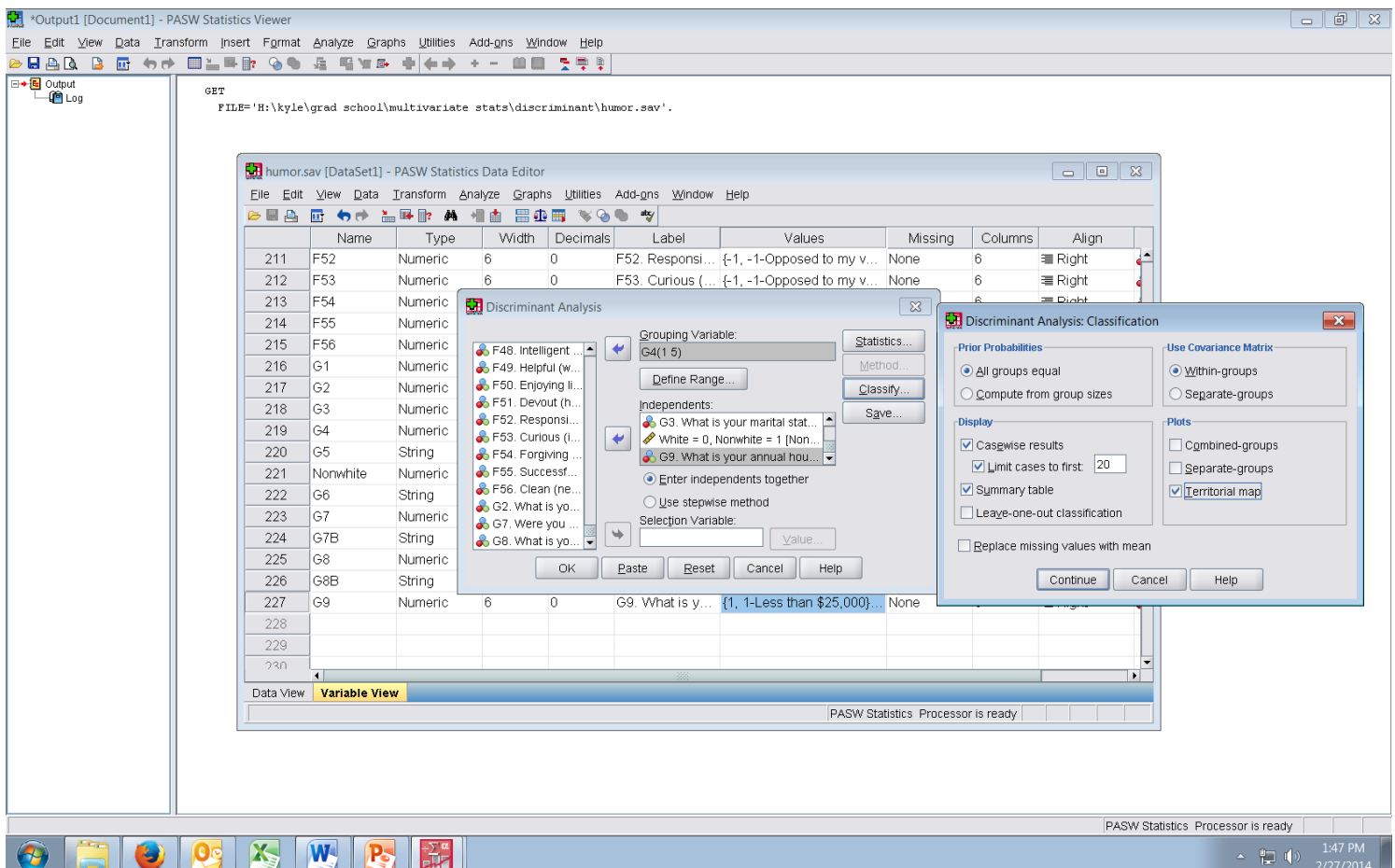
-Under “descriptives”, check means, univariate ANOVA and Box’s M

-Under “function coefficients” check Fisher’s

-Click continue



- Click on the “Classify” button
- Under “prior probabilities” choose “all groups equal”
- Under “display” check casewise results, limit cases to first 20, and summary table
- Under “use covariance matrix” choose “within-groups”
- Under “plots” check territorial map
- Click continue
- Click Ok to run discriminant analysis



III. SPSS Output

```
DISCRIMINANT
  /GROUPS=G4(1 5)
  /VARIABLES=B1 B2 B3 B6 B7 B8 B9 B10 B12 B20 SEX married Nonwhite G9
  /ANALYSIS ALL
  /PRIORS EQUAL
  /STATISTICS=MEAN STDDEV UNIVF BOXM COEFF TABLE
  /PLOT=MAP
  /PLOT=CASES(20)
  /CLASSIFY=NONMISSING POOLED.
```

Discriminant

[DataSet1] H:\kyle\grad school\multivariate stats\discriminant\humor.sav

Analysis Case Processing Summary

Unweighted Cases		N	Percent
Valid		192	66.7
Excluded	Missing or out-of-range group codes	27	9.4
	At least one missing discriminating variable	16	5.6
	Both missing or out-of-range group codes and at least one missing discriminating variable	53	18.4
	Total	96	33.3
Total		288	100.0

Group Statistics

G4. Which of the following categories best describes your political philosophy?		Mean	Std. Deviation	Valid N (listwise)	
				Unweighted	Weighted
1-Strong conservative	B1. Barack Obama is doing a good job as president.	4.0833	3.77692	12	12.000
	B2. I believe that O.J. Simpson is innocent of murder.	1.1667	1.52753	12	12.000
	B3. Affirmative action is still necessary to help minorities and other groups.	5.3333	4.05268	12	12.000
	B6. Abortion should remain legal.	4.5833	4.75697	12	12.000
	B7. All human cloning should be banned.	5.3333	4.73542	12	12.000
	B8. I favor the death penalty for a person convicted of murder.	6.5833	3.98767	12	12.000
	B9. Marriages between same-sex couples should be recognized by the law as valid, with the same rights as traditional marriages.	1.9167	2.99874	12	12.000
	B10. The laws covering the sale of firearms should be made more strict.	5.5833	3.94181	12	12.000
	B12. The U.S. healthcare system today is in a state of crisis.	6.6667	3.72542	12	12.000
	B20. In general, do you think there is too much or too little government regulation of business and industry?	6.0833	2.84312	12	12.000
	0-male; 1-female	.2500	.45227	12	12.000
	(0-not married, 1-married)	.0000	.00000	12	12.000
	White = 0, Nonwhite = 1	.3333	.49237	12	12.000
	G9. What is your annual household income?	2.7500	1.81534	12	12.000
2-Lean towards conservative	B1. Barack Obama is doing a good job as president.	3.1071	2.48461	28	28.000

	B2. I believe that O.J. Simpson is innocent of murder.	1.6786	2.31026	28	28.000
	B3. Affirmative action is still necessary to help minorities and other groups.	2.7500	2.54769	28	28.000
	B6. Abortion should remain legal.	4.9643	3.55363	28	28.000
	B7. All human cloning should be banned.	4.5357	3.13265	28	28.000
	B8. I favor the death penalty for a person convicted of murder.	7.1429	3.54562	28	28.000
	B9. Marriages between same-sex couples should be recognized by the law as valid, with the same rights as traditional marriages.	5.3929	3.72518	28	28.000
	B10. The laws covering the sale of firearms should be made more strict.	4.8929	3.77457	28	28.000
	B12. The U.S. healthcare system today is in a state of crisis.	5.5714	2.58813	28	28.000
	B20. In general, do you think there is too much or too little government regulation of business and industry?	5.7857	1.98806	28	28.000
	0-male; 1-female	.5000	.50918	28	28.000
	(0-not married, 1-married)	.0000	.00000	28	28.000
	White = 0, Nonwhite = 1	.1429	.35635	28	28.000
	G9. What is your annual household income?	3.2500	1.75594	28	28.000
3-Middle of the road	B1. Barack Obama is doing a good job as president.	5.4576	3.02474	59	59.000
	B2. I believe that O.J. Simpson is innocent of murder.	2.5085	2.45211	59	59.000
	B3. Affirmative action is still necessary to help minorities and other groups.	4.2881	2.85905	59	59.000
	B6. Abortion should remain legal.	5.7966	2.91713	59	59.000

	B7. All human cloning should be banned.	4.3559	3.35674	59	59.000
	B8. I favor the death penalty for a person convicted of murder.	6.0508	3.09295	59	59.000
	B9. Marriages between same-sex couples should be recognized by the law as valid, with the same rights as traditional marriages.	5.7119	3.88210	59	59.000
	B10. The laws covering the sale of firearms should be made more strict.	6.0000	3.26950	59	59.000
	B12. The U.S. healthcare system today is in a state of crisis.	6.6780	2.70020	59	59.000
	B20. In general, do you think there is too much or too little government regulation of business and industry?	5.4068	2.19811	59	59.000
	0-male; 1-female	.3898	.49190	59	59.000
	(0-not married, 1-married)	.0339	.18252	59	59.000
	White = 0, Nonwhite = 1	.2203	.41803	59	59.000
	G9. What is your annual household income?	2.8814	1.50956	59	59.000
4-Lean towards liberal	B1. Barack Obama is doing a good job as president.	6.3276	2.15527	58	58.000
	B2. I believe that O.J. Simpson is innocent of murder.	1.9655	1.96429	58	58.000
	B3. Affirmative action is still necessary to help minorities and other groups.	5.0690	2.48407	58	58.000
	B6. Abortion should remain legal.	7.2931	3.38214	58	58.000
	B7. All human cloning should be banned.	4.7759	3.26084	58	58.000
	B8. I favor the death penalty for a person convicted of murder.	5.2414	3.28372	58	58.000
	B9. Marriages between same-sex couples should be recognized by the law as valid, with the same rights as traditional marriages.	7.7069	3.12886	58	58.000

	B10. The laws covering the sale of firearms should be made more strict.	7.0690	2.88287	58	58.000
	B12. The U.S. healthcare system today is in a state of crisis.	7.3793	2.15070	58	58.000
	B20. In general, do you think there is too much or too little government regulation of business and industry?	4.4828	1.94883	58	58.000
	0-male; 1-female	.7069	.45916	58	58.000
	(0-not married, 1-married)	.0690	.25561	58	58.000
	White = 0, Nonwhite = 1	.2241	.42066	58	58.000
	G9. What is your annual household income?	2.6897	1.40434	58	58.000
5-Strong liberal	B1. Barack Obama is doing a good job as president.	6.9429	2.46078	35	35.000
	B2. I believe that O.J. Simpson is innocent of murder.	3.4857	3.52613	35	35.000
	B3. Affirmative action is still necessary to help minorities and other groups.	6.5429	3.48394	35	35.000
	B6. Abortion should remain legal.	7.9714	3.23115	35	35.000
	B7. All human cloning should be banned.	5.2571	3.80667	35	35.000
	B8. I favor the death penalty for a person convicted of murder.	4.6571	3.73334	35	35.000
	B9. Marriages between same-sex couples should be recognized by the law as valid, with the same rights as traditional marriages.	9.1429	1.88091	35	35.000
	B10. The laws covering the sale of firearms should be made more strict.	7.4857	2.62758	35	35.000
	B12. The U.S. healthcare system today is in a state of crisis.	8.2286	1.98651	35	35.000
	B20. In general, do you think there is too much or too little government regulation of business and industry?	3.9429	2.86913	35	35.000

	0-male; 1-female	.6571	.48159	35	35.000
	(0-not married, 1-married)	.0000	.00000	35	35.000
	White = 0, Nonwhite = 1	.4857	.50709	35	35.000
	G9. What is your annual household income?	2.6571	1.57074	35	35.000
Total	B1. Barack Obama is doing a good job as president.	5.5625	2.91345	192	192.000
	B2. I believe that O.J. Simpson is innocent of murder.	2.3177	2.55374	192	192.000
	B3. Affirmative action is still necessary to help minorities and other groups.	4.7760	3.10494	192	192.000
	B6. Abortion should remain legal.	6.4479	3.50129	192	192.000
	B7. All human cloning should be banned.	4.7344	3.46066	192	192.000
	B8. I favor the death penalty for a person convicted of murder.	5.7448	3.45691	192	192.000
	B9. Marriages between same-sex couples should be recognized by the law as valid, with the same rights as traditional marriages.	6.6563	3.74118	192	192.000
	B10. The laws covering the sale of firearms should be made more strict.	6.4063	3.26196	192	192.000
	B12. The U.S. healthcare system today is in a state of crisis.	7.0104	2.58872	192	192.000
	B20. In general, do you think there is too much or too little government regulation of business and industry?	4.9583	2.36429	192	192.000
	0-male; 1-female	.5417	.49956	192	192.000
	(0-not married, 1-married)	.0313	.17445	192	192.000
	White = 0, Nonwhite = 1	.2656	.44282	192	192.000
	G9. What is your annual household income?	2.8281	1.54399	192	192.000

Tests of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Sig.
B1. Barack Obama is doing a good job as president.	.817	10.457	4	187	.000
B2. I believe that O.J. Simpson is innocent of murder.	.932	3.399	4	187	.010
B3. Affirmative action is still necessary to help minorities and other groups.	.866	7.241	4	187	.000
B6. Abortion should remain legal.	.893	5.614	4	187	.000
B7. All human cloning should be banned.	.990	.486	4	187	.746
B8. I favor the death penalty for a person convicted of murder.	.945	2.704	4	187	.032
B9. Marriages between same-sex couples should be recognized by the law as valid, with the same rights as traditional marriages.	.758	14.937	4	187	.000
B10. The laws covering the sale of firearms should be made more strict.	.927	3.679	4	187	.007
B12. The U.S. healthcare system today is in a state of crisis.	.902	5.093	4	187	.001
B20. In general, do you think there is too much or too little government regulation of business and industry?	.911	4.589	4	187	.001
0-male; 1-female	.906	4.849	4	187	.001
(0-not married, 1-married)	.973	1.291	4	187	.275
White = 0, Nonwhite = 1	.936	3.191	4	187	.015
G9. What is your annual household income?	.984	.768	4	187	.547

Analysis 1

Box's Test of Equality of Covariance Matrices

Log Determinants		
G4. Which of the following categories best describes your political philosophy?	Rank	Log Determinant
1-Strong conservative	. ^a	. ^b
2-Lean towards conservative	13	. ^c
3-Middle of the road	14	13.214
4-Lean towards liberal	14	10.521
5-Strong liberal	13	. ^c
Pooled within-groups	14	14.075

The ranks and natural logarithms of determinants printed are those of the group covariance matrices.

- a. Rank < 12
- b. Too few cases to be non-singular
- c. Singular

Test Results ^a		
Box's M		358.249
F	Approx.	2.975
	df1	105
	df2	41176.043
	Sig.	.000

Tests null hypothesis of equal population covariance matrices.

- a. Some covariance matrices are singular and the usual procedure will not work. The non-singular groups will be tested against their own pooled within-groups covariance matrix. The log of its determinant is 14.995.

Summary of Canonical Discriminant Functions

Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.692 ^a	67.9	67.9	.639
2	.154 ^a	15.1	82.9	.365
3	.111 ^a	10.9	93.8	.316
4	.063 ^a	6.2	100.0	.243

a. First 4 canonical discriminant functions were used in the analysis.

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	Df	Sig.
1 through 4	.434	151.575	56	.000
2 through 4	.734	56.149	39	.037
3 through 4	.847	30.203	24	.178
4	.941	11.061	11	.438

Standardized Canonical Discriminant Function Coefficients

	Function			
	1	2	3	4
B1. Barack Obama is doing a good job as president.	.175	-.116	-.474	.697
B2. I believe that O.J. Simpson is innocent of murder.	.080	.159	.394	.614
B3. Affirmative action is still necessary to help minorities and other groups.	.194	.501	-.349	-.358
B6. Abortion should remain legal.	.174	-.113	-.130	-.234
B7. All human cloning should be banned.	.156	.124	.073	-.273
B8. I favor the death penalty for a person convicted of murder.	-.209	.123	.230	.050
B9. Marriages between same-sex couples should be recognized by the law as valid, with the same rights as traditional marriages.	.672	-.072	.584	.089
B10. The laws covering the sale of firearms should be made more strict.	-.031	.124	-.311	.082
B12. The U.S. healthcare system today is in a state of crisis.	.221	.214	-.088	-.110
B20. In general, do you think there is too much or too little government regulation of business and industry?	-.195	.139	-.130	.189
0-male; 1-female	.214	-.566	.094	-.398
(0-not married, 1-married)	.112	-.549	-.284	.034
White = 0, Nonwhite = 1	.065	.487	.550	-.300
G9. What is your annual household income?	-.098	-.023	.161	.175

Structure Matrix

	Function			
	1	2	3	4
B9. Marriages between same-sex couples should be recognized by the law as valid, with the same rights as traditional marriages.	.649*	-.247	.393	.138
B1. Barack Obama is doing a good job as president.	.517*	.135	-.480	.403
B6. Abortion should remain legal.	.415*	-.034	-.072	-.051
B20. In general, do you think there is too much or too little government regulation of business and industry?	-.376*	.005	.004	.098
B12. The U.S. healthcare system today is in a state of crisis.	.364*	.265	-.244	-.045
B10. The laws covering the sale of firearms should be made more strict.	.322*	.056	-.240	-.035
B8. I favor the death penalty for a person convicted of murder.	-.278*	-.086	.168	-.032
B3. Affirmative action is still necessary to help minorities and other groups.	.377	.514*	-.347	-.207
White = 0, Nonwhite = 1	.203	.498*	.065	-.143
(0-not married, 1-married)	.053	-.293	-.326*	.099
G9. What is your annual household income?	-.116	-.082	.233*	.027
B2. I believe that O.J. Simpson is innocent of murder.	.220	.317	.265	.503*
0-male; 1-female	.320	-.372	.084	-.419*
B7. All human cloning should be banned.	.062	.139	-.012	-.275*

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions

Variables ordered by absolute size of correlation within function.

*. Largest absolute correlation between each variable and any discriminant function

Functions at Group Centroids

G4. Which of the following categories best describes your political philosophy?	Function			
	1	2	3	4
1-Strong conservative	-1.440	.831	-.584	-.504
2-Lean towards conservative	-1.014	-.289	.586	-.193
3-Middle of the road	-.436	.075	-.082	.339
4-Lean towards liberal	.517	-.404	-.254	-.119
5-Strong liberal	1.183	.488	.291	-.047

Unstandardized canonical discriminant functions evaluated at group means

Classification Statistics

Classification Processing Summary

Processed	288
Excluded	0
Missing or out-of-range group codes	
At least one missing discriminating variable	69
Used in Output	219

Prior Probabilities for Groups

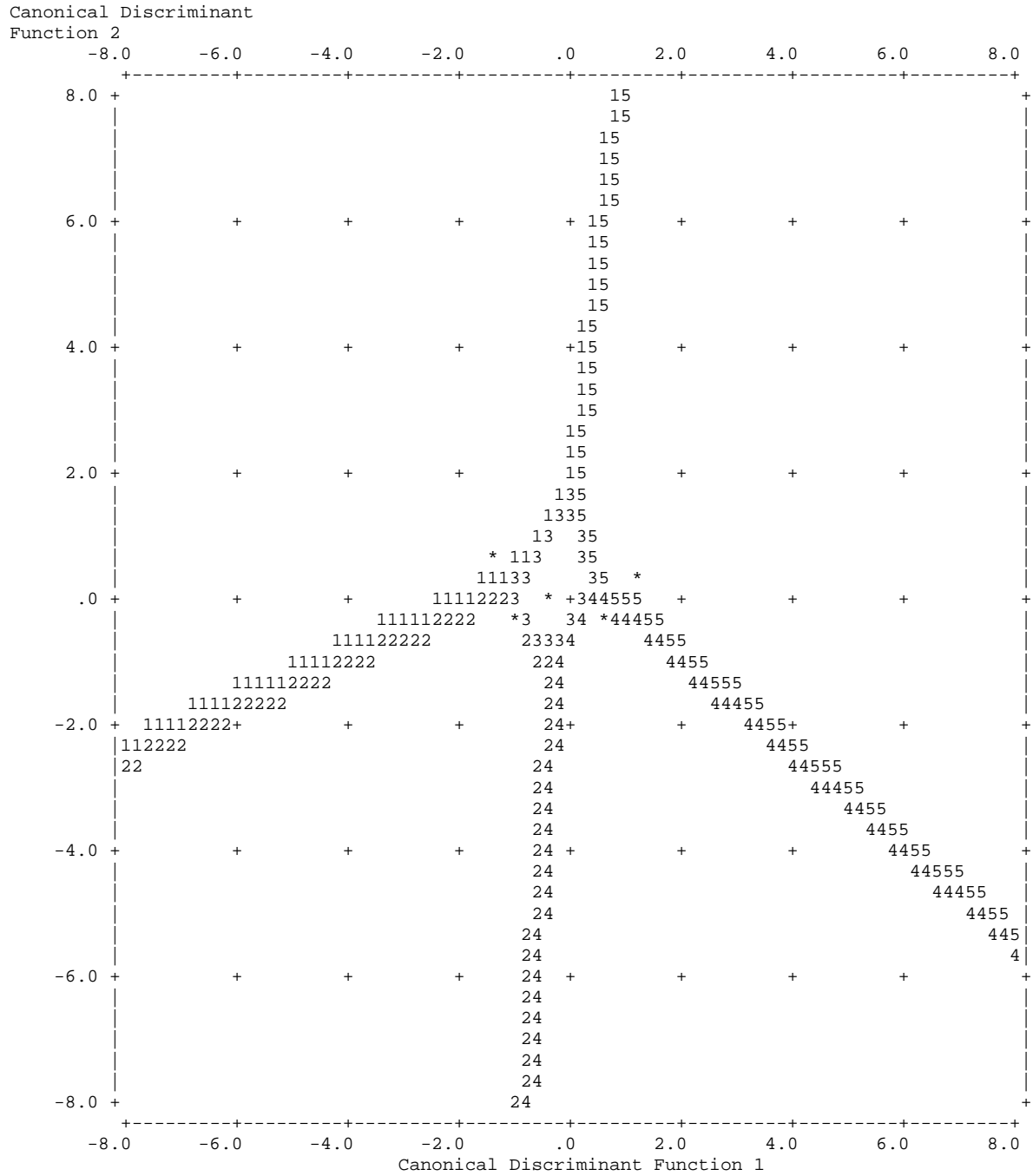
G4. Which of the following categories best describes your political philosophy?	Prior	Cases Used in Analysis	
		Unweighted	Weighted
1-Strong conservative	.200	12	12.000
2-Lean towards conservative	.200	28	28.000
3-Middle of the road	.200	59	59.000
4-Lean towards liberal	.200	58	58.000
5-Strong liberal	.200	35	35.000
Total	1.000	192	192.000

Classification Function Coefficients

	G4. Which of the following categories best describes your political philosophy?				
	1-Strong conservative	2-Lean towards conservative	3-Middle of the road	4-Lean towards liberal	5-Strong liberal
B1. Barack Obama is doing a good job as president.	.428	.378	.658	.653	.579
B2. I believe that O.J. Simpson is innocent of murder.	.098	.302	.369	.229	.411
B3. Affirmative action is still necessary to help minorities and other groups.	.546	.204	.320	.377	.500
B6. Abortion should remain legal.	.119	.112	.118	.223	.201
B7. All human cloning should be banned.	.372	.352	.335	.393	.460
B8. I favor the death penalty for a person convicted of murder.	.558	.575	.515	.421	.451
B9. Marriages between same-sex couples should be recognized by the law as valid, with the same rights as traditional marriages.	.242	.569	.575	.738	.953
B10. The laws covering the sale of firearms should be made more strict.	.391	.236	.324	.301	.278
B12. The U.S. healthcare system today is in a state of crisis.	1.081	.967	1.050	1.120	1.233
B20. In general, do you think there is too much or too little government regulation of business and industry?	1.580	1.435	1.490	1.351	1.324
0-male; 1-female	-1.589	-.109	-.851	.481	-.226
(0-not married, 1-married)	-4.009	-2.051	-1.628	.690	-2.572
White = 0, Nonwhite = 1	1.060	1.134	.414	.117	1.861
G9. What is your annual household income?	1.009	1.156	1.104	.981	.991
(Constant)	-18.196	-16.752	-18.779	-20.306	-23.810

Fisher's linear discriminant functions

Territorial Map
(Assuming all functions but the first two are zero)



Symbols used in territorial map

Symbol	Group	Label
1	1	1-Strong conservativ
2	2	2-Lean towards conse
3	3	3-Middle of the road
4	4	4-Lean towards liber
5	5	5-Strong liberal
*		Indicates a group centroid

Casewise Statistics

Case Number	Actual Group	Predicted Group	Highest Group				Second Highest Group			Discriminant Scores			
			P(D>d G=g)		P(G=g D=d)	Squared Mahalanobis Distance to Centroid	Group	P(G=g D=d)	Squared Mahalanobis Distance to Centroid	Function 1	Function 2	Function 3	Function 4
			p	df									
Original 2	3	4**	.923	4	.612	.912	3	.158	3.619	.813	-1.302	-.305	.002
5	ungrouped	4	.283	4	.688	5.043	3	.176	7.766	.002	-1.956	-1.749	-.479
7	5	5	.250	4	.790	5.384	3	.105	9.417	1.713	1.192	.672	2.065
8	2	5**	.573	4	.743	2.909	4	.167	5.900	1.920	.766	.070	1.450
9	ungrouped	5	.418	4	.360	3.910	4	.234	4.767	.615	1.490	-1.206	-.632
11	3	4**	.956	4	.573	.660	3	.189	2.877	.499	-.748	-.898	-.475
12	5	2**	.385	4	.512	4.162	3	.270	5.439	-.356	-.020	2.190	.847
13	3	4**	.964	4	.571	.589	3	.190	2.789	.592	-.669	-.938	-.331
14	4	2**	.823	4	.290	1.522	3	.271	1.655	-1.062	-.415	-.592	-.535
17	1	1	.945	4	.368	.749	3	.274	1.338	-1.017	.091	-.714	-.437
18	ungrouped	4	.618	4	.412	2.652	2	.273	3.474	-.275	-1.796	-.145	.153
19	4	5**	.700	4	.852	2.193	4	.093	6.616	1.741	1.824	.102	-.294
20	3	4**	.031	4	.484	10.653	5	.250	11.973	1.501	-1.252	-.259	2.876
21	3	1**	.905	4	.574	1.029	3	.232	2.838	-1.719	.246	-1.123	.059
22	5	5	.812	4	.625	1.583	4	.137	4.616	.761	1.061	1.279	-.363
23	3	3	.150	4	.421	6.748	1	.368	7.020	-2.353	-.205	-1.178	1.678
24	5	3**	.453	4	.348	3.670	5	.287	4.052	.081	.595	1.511	1.110
25	4	4	.361	4	.360	4.344	1	.250	5.075	.399	.650	-1.322	-1.560
28	3	1**	.896	4	.490	1.092	2	.237	2.548	-.996	.940	.136	-1.108
29	ungrouped	4	.955	4	.439	.671	3	.241	1.870	.268	-1.040	.157	.066

** . Misclassified case

Classification Results^a

G4. Which of the following categories best describes your political philosophy?		Predicted Group Membership					Total	
		1-Strong conservative	2-Lean towards conservative	3-Middle of the road	4-Lean towards liberal	5-Strong liberal		
Original	Count	1-Strong conservative	8	2	0	0	2	12
		2-Lean towards conservative	7	15	4	1	1	28
		3-Middle of the road	12	10	20	13	4	59
		4-Lean towards liberal	3	4	10	33	8	58
		5-Strong liberal	0	3	3	10	19	35
		Ungrouped cases	5	2	2	9	9	27
%		1-Strong conservative	66.7	16.7	.0	.0	16.7	100.0
		2-Lean towards conservative	25.0	53.6	14.3	3.6	3.6	100.0
		3-Middle of the road	20.3	16.9	33.9	22.0	6.8	100.0
		4-Lean towards liberal	5.2	6.9	17.2	56.9	13.8	100.0
		5-Strong liberal	.0	8.6	8.6	28.6	54.3	100.0
		Ungrouped cases	18.5	7.4	7.4	33.3	33.3	100.0

a. 49.5% of original grouped cases correctly classified.

IV. Tabling Results

Table 1

	Standardized coefficients		Loadings	
	DF1 (Progressive social views)	DF2 (Minority)	DF1 (Progressive social views)	DF2 (Minority)
B1. Barack Obama is doing a good job as president.	0.175	-0.116	0.517	0.135
B2. I believe that O.J. Simpson is innocent of murder.	0.080	0.159	0.220	0.317
B3. Affirmative action is still necessary to help minorities and other groups.	0.194	0.501	0.377	0.514
B6. Abortion should remain legal.	0.174	-0.113	0.415	-0.034
B7. All human cloning should be banned.	0.156	0.124	0.062	0.139
B8. I favor the death penalty for a person convicted of murder.	-0.209	-0.072	-0.278	-0.086
B9. Marriages between same-sex couples should be recognized by the law as valid, with the same rights as traditional marriages.	0.672	-0.072	0.649	-0.247
B10. The laws covering the sale of firearms should be made more strict.	-0.031	0.124	0.322	0.056
B12. The U.S. healthcare system today is in a state of crisis.	0.221	0.214	0.364	0.265
B20. In general, do you think there is too much or too little government regulation of business and industry?	-0.195	0.139	-0.376	0.005
Sex (0=male, 1=female)	0.214	-0.566	0.320	-0.372
Married (0=not married, 1=married)	0.112	-0.549	0.053	-0.293
White = 0, Nonwhite = 1	0.065	0.487	0.203	0.498
G9. What is your annual household income?	-0.098	-0.023	-0.116	-0.082

largest absolute correlation between each variable and any discriminant function

Table 2: Group Statistics: Centroids (Means)

Political leaning	DF1 (Progressive social views)	DF2 (Minority)
1-Strong conservative	-1.440	0.831
2-Lean towards conservative	-1.014	-0.289
3-Middle of the road	-0.436	0.075
4-Lean towards liberal	0.517	-0.404
5-Strong liberal	1.183	0.488
Wilks' Lambda	0.434	0.300
Chi-square	151.575	56.149
Sig.	0.000	0.037
Eigenvalue	0.692	0.154
Canonical Correlation	0.639	0.365

Table 3**Classification matrix results**

Observed		Predicted group				
Group	group size	1-Strong conservative	2-Lean towards conservative	3-Middle of the road	4-Lean towards liberal	5-Strong liberal
1-Strong conservative	12	8	2	0	0	2
2-Lean towards conservative	28	7	15	4	1	1
3-Middle of the road	59	12	10	20	13	4
4-Lean towards liberal	58	3	4	10	33	8
5-Strong liberal	35	0	3	3	10	19
Ungrouped cases	27	5	2	2	9	9
Total	219					

49.5% of original grouped cases correctly classified

Press' Q

$$Press' Q = \frac{[N-(nK)]^2}{N(K-1)}$$

N=total sample size (192)

n = number observations correctly classified=95

K= number of groups=5

$$Press' Q = \frac{[192-(95*5)]^2}{192(5-1)} = 104.2826$$

Chi-squared Critical Value Table (df=1)	
90% significance	2.706
95% significance	3.841
99% significance	6.635
99.5% significance	7.879

V. Write-up of results

Discriminant analysis was used to assess an individual's classification into one of the five groups of political leanings according to fourteen independent variables from the Humor and Public Opinion dataset (Neuendorf and Skalski, 2010). The fourteen discriminating variables used to classify political viewpoints contain a series of questions designed to target an individual's social views around same-sex marriage, abortion, cloning, the death penalty, the sale of fire-arms, the state of the healthcare system. Other variables are introduced to get a sense of what type of government an individual wants; Is Barack Obama doing a good job?, Affirmative action is still necessary to help minorities, and a view on the amount of government regulation in business and industry. The remaining variables are meant to capture demographic variation and include: sex (dummied as 0=male, 1=female) marital status (dummied as 0=not married, 1=married), nonwhite (dummied as 0=white, 1=nonwhite), annual household income. The five groups that individuals will classify into based upon the discriminating variables are strong conservative, leans toward conservative, middle of the road, leans toward liberal, strong liberal.

The analysis produced four discriminant functions, two of which were significant. The first discriminant function is highly significant ($p < 0.001$) and corresponds with a label of "progressive social views". Highly loading variables, in descending order, are same-sex marriage (0.649), Obama doing a good job as president (0.517), abortion (0.415), amount of government regulation (-0.376), state of the healthcare system (0.364), stricter fire-arm sales (0.322) and death penalty for murder (-0.278). The first discriminant function has a Wilk's Lambda of 0.434, indicating that there is still slightly more than half of discrimination left to capture. A canonical correlation of 0.639 for the first DF equates to coefficient of determination aka shared variance of 0.408. The second discriminant function is significant at the 5% level ($p < 0.037$) and has a

label of “minority” as the high loading variables are pro-affirmative action views and a tendency to identify as non-white (0.498). The second discriminant function has a Wilk’s Lambda of 0.300 ($0.734 - 0.434 = 0.300$), indicating that roughly 1/4ths of the total discrimination remains to be explained. A canonical correlation of 0.365 for the second DF equates to coefficient of determination aka shared variance of 0.133.

Group centroids and territorial maps indicate that the groups differ according to the first and second discriminate functions. According the first discriminant function of “progressive social views” is rather straight forward to understand, strong liberals have the highest values (1.183) while strong conservatives have the lowest value (-1.440). The second discriminate factor is not as simple as the both the strong conservative (0.831) and strong liberal (0.488) have higher group means than the others.

Classification into five groups according to the independent variables using discriminant analysis results in overall success rate of 49.5%. Amongst the groups strong conservative had the highest success rate at 75% although this group only had 12 observations to match. A Press’ Q of 104.28 indicates that using the independent variables to predict political groups is significantly better than classification by chance ($p < 0.001$). A simple comparison of probability of 20% (accurate classification into one of five groups) vs. 49.5% success rate also supports the view that the discriminant analysis used here is better than chance.