

Stepwise Multiple Regression Model

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COM 631/731

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I. MODEL

IV ((X₁...X_n))

Q1

Q2

Q9

Q10

Q11

Q12

Q15

Q46

Q101

Q104

Q105

Q106

Q107

Q109



DV (Y)

Political Participation

Variables

DV

Political Participation

Q20: I learn about community activities and problems from the community newspaper

Q21. I'd feel comfortable voicing a complaint at a public meeting in my community

Q23. Public officials in my community seem receptive to views of residents

Q24. I generally discuss political candidates and issues with neighbors at election time.

Q25. I generally discuss political candidates and issues with family and friends at election time.

Q31. Public officials in this community don't care much what people like me think

Q80. How many days in the past week did you engage in political discussion with friends and family, never, once, a couple times, almost every day, or several times a day?

Q81. How often do you discuss politics with people whose political views are different from yours--almost never, seldom, sometimes, or frequently?

Q82. About how many people do you discuss politics with on a regular basis, none, one, two or three, five to ten, or more than that?

The dependent variable is Political Participation, a scale which measures "activities aiming to shape the structure and policies of the government as well as the choice of those who run it."

Bessette, J.M. & Pitney, J.J. (2011) *American Government and Politics: Deliberation, Democracy, and Citizenship*. Boston: Wadsworth

The above variables were standardized and added to construct the scale:

$$PP = ZQ20+ZQ21+ZQ23+ZQ24+ZQ25+ZQ31+ZQ80+ZQ81+ZQ82$$

IV

Q1: Rural: "Which of the following best describes where you live? (1-6 measure of ruralness; 1=central city, 6=in the country)

Q2: Time lived there? (1-7)

Q9: Your neighborhood or community (0-10)

Q10: Your religion (0-10)

Q11: Your ethnic or racial heritage (0-10)

Q12: Being an American (0-10)

Q15: Your personal or political philosophy (0-10)

Q46. Political clubs or organizations? (0-no 1=yes)

Q101. How many hours did you listen to the radio yesterday? (0-11)

Q104. Age (in categories)

Q105. Education completed in categories

Q106. Ethnic or racial background (coded as Black 1, White 0)

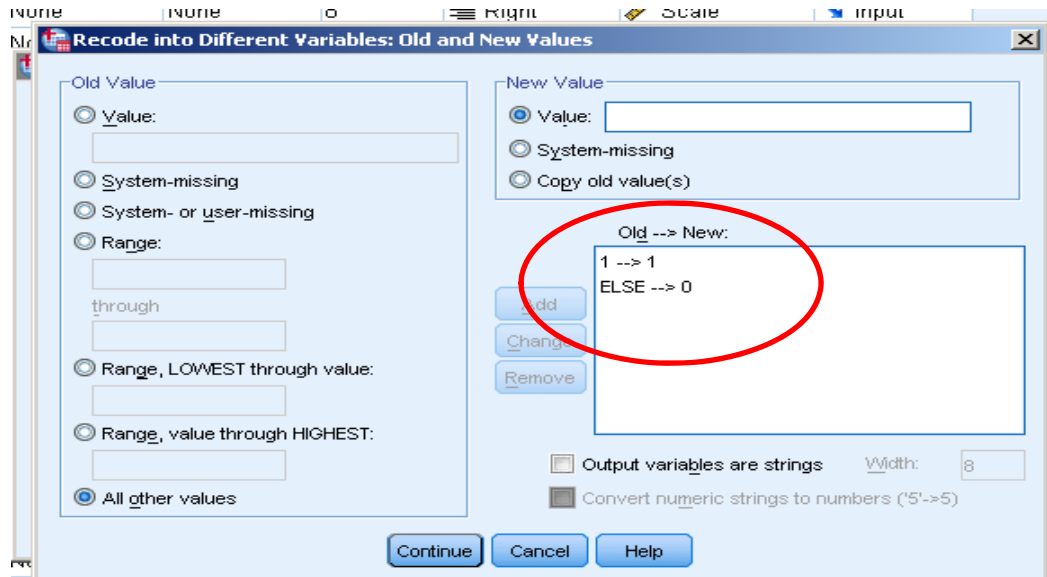
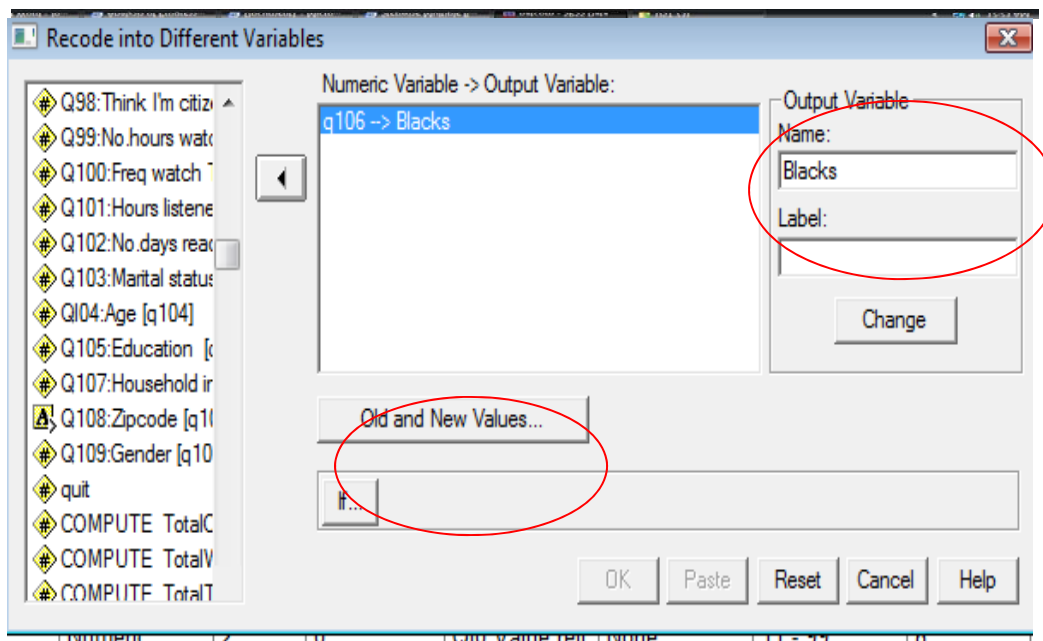
Q107. Annual household income in categories

Q109. Gender (coded as Female 1, Male as 0)

II. RUNNING SPSS

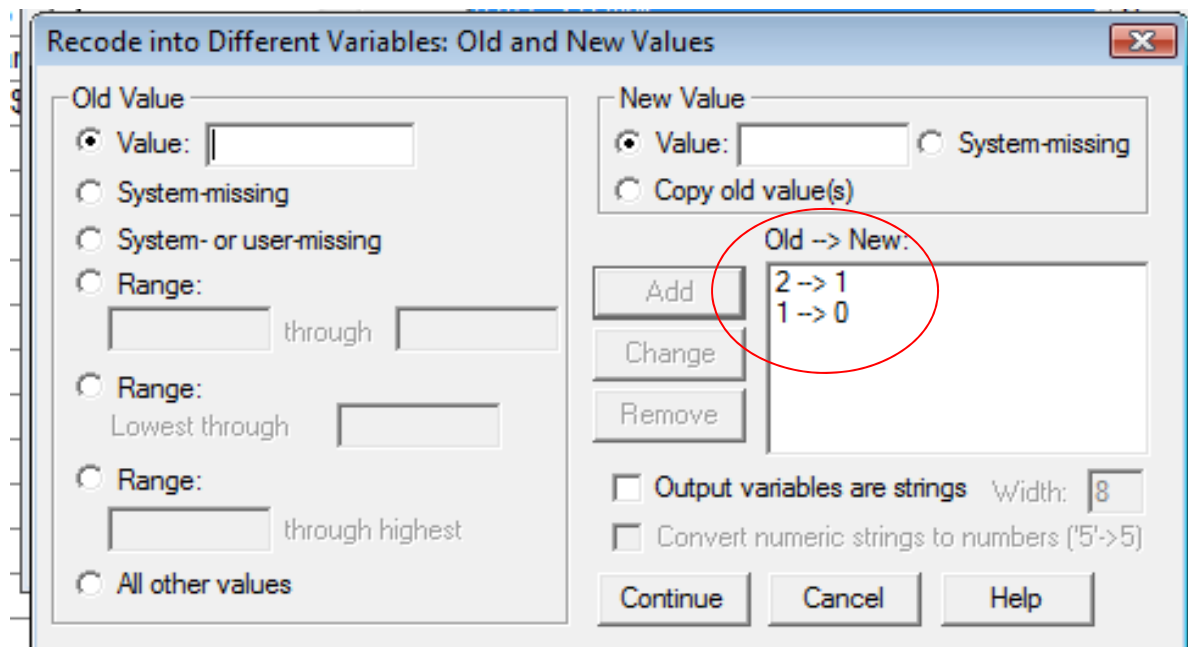
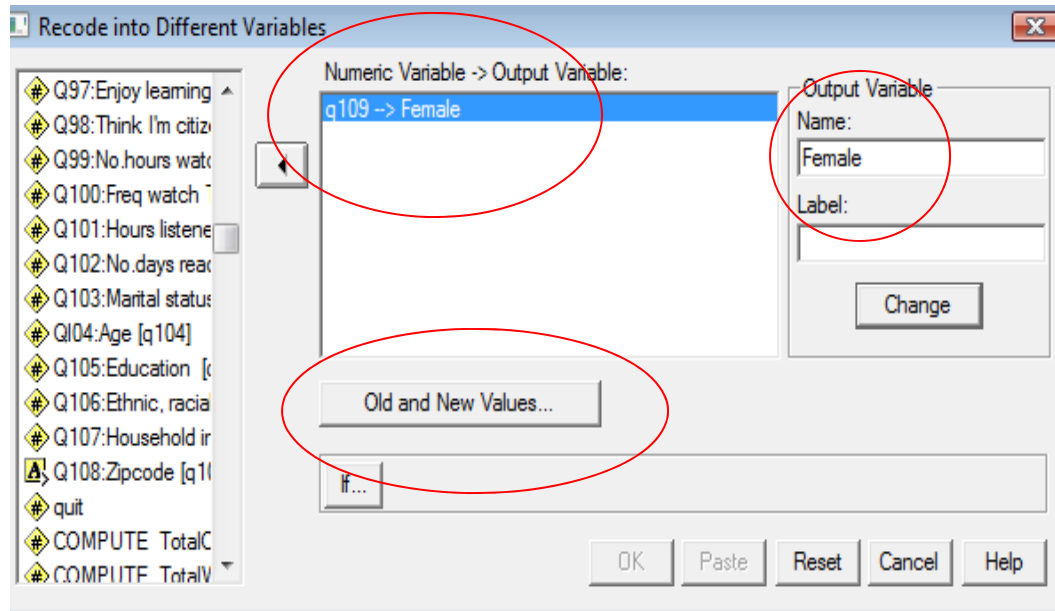
Dummy coding Ethnic or racial background

Transform → Recode into Different Variables



Dummy coding Gender

Transform → Recode into Different Variables



Running the Stepwise Regression

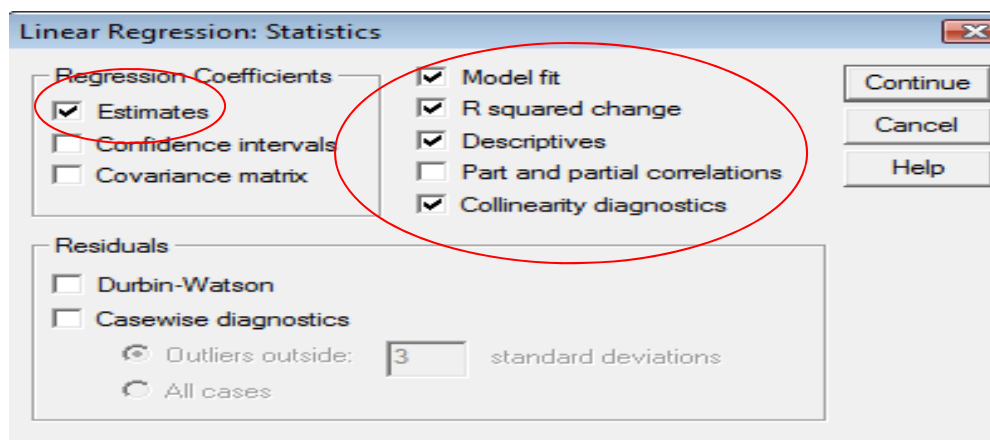
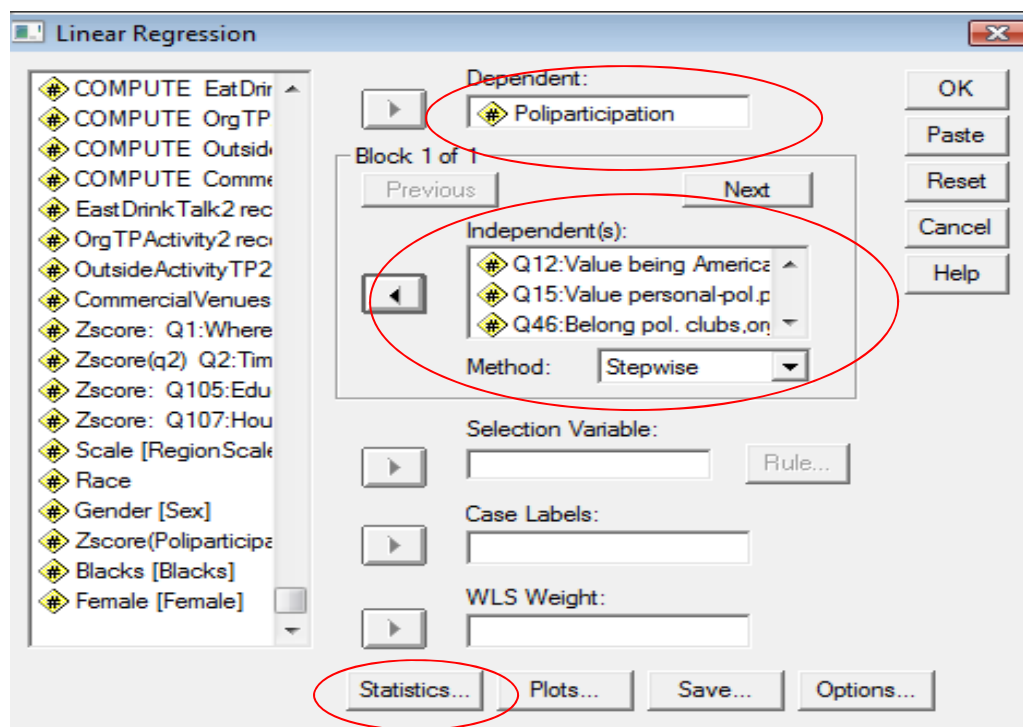
Analyze → **Regression** → **Linear...**

Add your DV at the top, and your IVs below

Select 'Stepwise' from the 'Method:' dropdown box below your IV list

Click the 'Statistics...' button on the bottom. Make sure that 'Estimate', 'Model fit', 'R squared change',

'Descriptives', and 'Collinearity diagnostics' are checked.



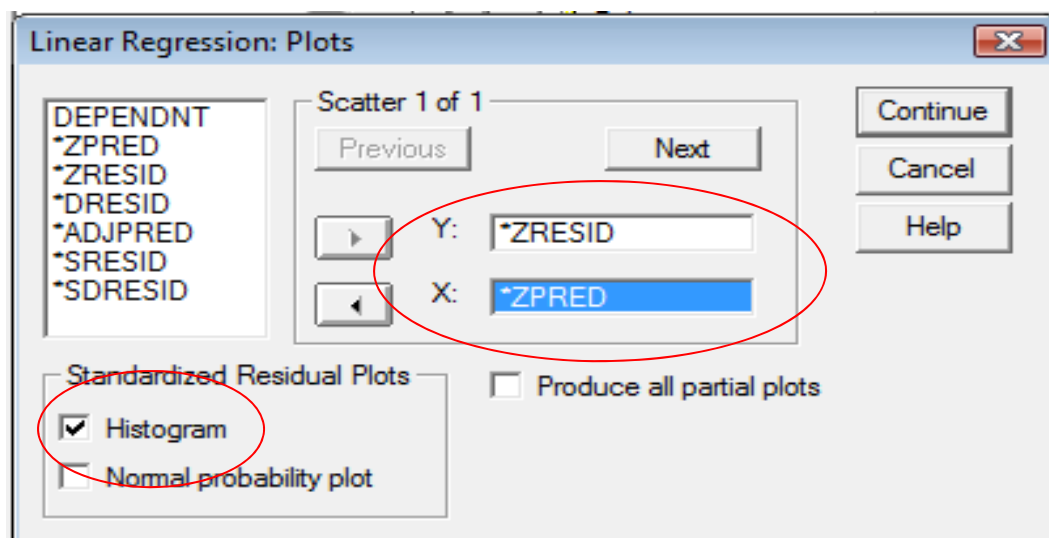
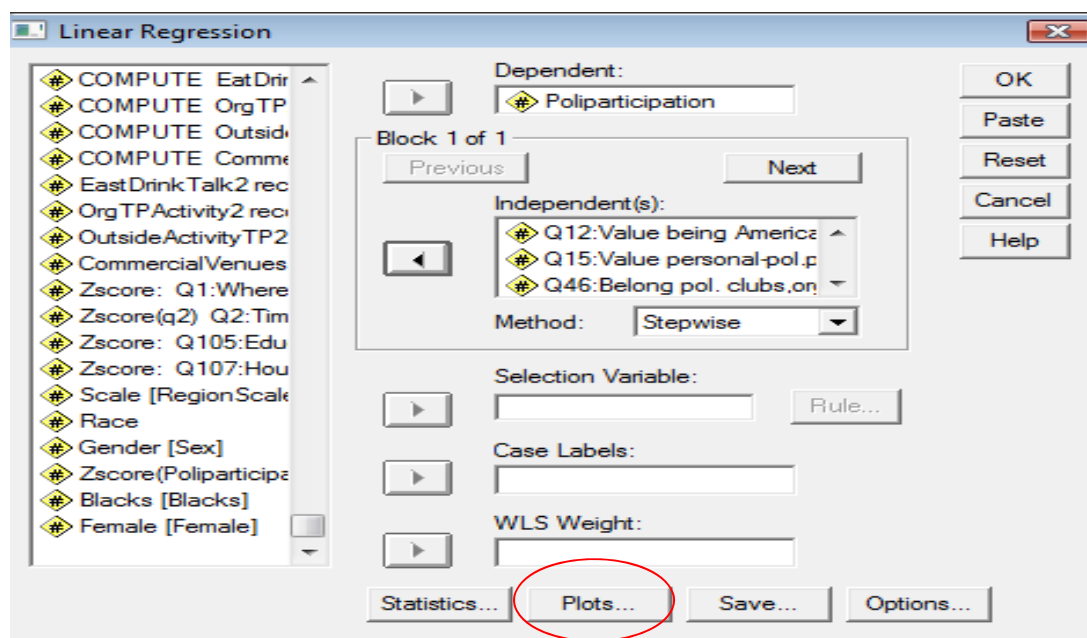
Running the Stepwise Regression (cont.)

Select 'Plots...'

Add *ZRESID as the Y, and *ZPRED as the X

Check the 'Histogram' box under 'Standardized Residual Plots'

Select 'Continue' then 'OK' to run the regression



III. SPSS Output:

▼ [DataSet1] F:\presentation 3.4\natcom.sav

Descriptive Statistics

	Mean	Std. Deviation	N
PP	39.6538	11.56786	312
Female	.5160	.50055	312
Q104:Age	4.33	1.605	312
Black	.1346	.34186	312
Q1:Where live	3.56	1.815	312
Q2:Time lived there	3.90	1.913	312
Q107:Household income	4.79	2.217	312
Q9:Value neigh- community	7.29	2.084	312
Q10:Value religion	7.43	3.310	312
Q11:Value ethnic-racial heritage	6.04	3.429	312
Q12:Value being American	8.33	2.578	312
Q15:Value personal-pol. philosophy	6.88	2.598	312
Q46:Belong pol. clubs, orgs	.15	.358	312
Q101:Hours listened to radio yesterday	2.04	2.713	312

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Q15:Value personal-pol. philosophy	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
2	Q9:Value neigh-community	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
3	Q107: Household income	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
4	Q46:Belong pol. clubs, orgs	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
5	Q104:Age	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
6	Q101:Hours listened to radio yesterday	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a. Dependent Variable: PP

Model Summary^a

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.379 ^a	.144	.141	10.72081	.144	52.086	1	310	.000
2	.434 ^b	.188	.183	10.45699	.044	16.839	1	309	.000
3	.476 ^c	.227	.219	10.22116	.039	15.423	1	308	.000
4	.503 ^d	.253	.243	10.06430	.026	10.676	1	307	.001
5	.519 ^e	.270	.258	9.96542	.017	7.122	1	306	.008
6	.534 ^f	.285	.271	9.87951	.015	6.345	1	305	.012

- a. Predictors: (Constant), Q15:Value personal-pol.philosophy
- b. Predictors: (Constant), Q15:Value personal-pol.philosophy, Q9:Value neigh-community
- c. Predictors: (Constant), Q15:Value personal-pol.philosophy, Q9:Value neigh-community, Q107:Household income
- d. Predictors: (Constant), Q15:Value personal-pol.philosophy, Q9:Value neigh-community, Q107:Household income, Q46:Belong pol. clubs,orgs
- e. Predictors: (Constant), Q15:Value personal-pol.philosophy, Q9:Value neigh-community, Q107:Household income, Q46:Belong pol. clubs,orgs, Q104:Age
- f. Predictors: (Constant), Q15:Value personal-pol.philosophy, Q9:Value neigh-community, Q107:Household income, Q46:Belong pol. clubs,orgs, Q104:Age, Q101:Hours listened to radio yesterday
- g. Dependent Variable: PP

ANOVA ^g						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5986.554	1	5986.554	52.086	.000 ^a
	Residual	35630.061	310	114.936		
	Total	41616.615	311			
2	Regression	7827.905	2	3913.952	35.793	.000 ^b
	Residual	33788.711	309	109.349		
	Total	41616.615	311			
3	Regression	9439.184	3	3146.395	30.117	.000 ^c
	Residual	32177.432	308	104.472		
	Total	41616.615	311			
4	Regression	10520.556	4	2630.139	25.966	.000 ^d
	Residual	31096.059	307	101.290		
	Total	41616.615	311			
5	Regression	11227.854	5	2245.571	22.612	.000 ^e
	Residual	30388.762	306	99.310		
	Total	41616.615	311			
6	Regression	11847.166	6	1974.528	20.230	.000 ^f
	Residual	29769.449	305	97.605		
	Total	41616.615	311			

a. Predictors: (Constant), Q15:Value personal-pol.philosophy
b. Predictors: (Constant), Q15:Value personal-pol.philosophy, Q9:Value neigh-
community
c. Predictors: (Constant), Q15:Value personal-pol.philosophy, Q9:Value neigh-
community, Q107:Household income
d. Predictors: (Constant), Q15:Value personal-pol.philosophy, Q9:Value neigh-
community, Q107:Household income, Q46:Belong pol. clubs,orgs
e. Predictors: (Constant), Q15:Value personal-pol.philosophy, Q9:Value neigh-
community, Q107:Household income, Q46:Belong pol. clubs,orgs, Q104:Age
f. Predictors: (Constant), Q15:Value personal-pol.philosophy, Q9:Value neigh-
community, Q107:Household income, Q46:Belong pol. clubs,orgs, Q104:Age, Q101:
Hours listened to radio yesterday
g. Dependent Variable: PP

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	28.029	1.721		16.284	.000		
	Q15:Value personal-pol. philosophy	1.688	.234	.379	7.217	.000	1.000	1.000
2	(Constant)	20.338	2.516		8.082	.000		
	Q15:Value personal-pol. philosophy	1.557	.230	.350	6.756	.000	.981	1.020
	Q9:Value neigh-community	1.179	.287	.212	4.104	.000	.981	1.020
3	(Constant)	15.737	2.724		5.776	.000		
	Q15:Value personal-pol. philosophy	1.490	.226	.335	6.595	.000	.975	1.026
	Q9:Value neigh-community	1.196	.281	.216	4.259	.000	.980	1.020
	Q107:Household income	1.030	.262	.197	3.927	.000	.994	1.006
4	(Constant)	15.786	2.683		5.885	.000		
	Q15:Value personal-pol. philosophy	1.410	.224	.317	6.303	.000	.963	1.038
	Q9:Value neigh-community	1.189	.277	.214	4.300	.000	.980	1.020
	Q107:Household income	.979	.259	.188	3.787	.000	.991	1.009
	Q46:Belong pol. clubs, orgs	5.249	1.607	.163	3.267	.001	.983	1.017
5	(Constant)	13.171	2.831		4.652	.000		
	Q15:Value personal-pol. philosophy	1.301	.225	.292	5.775	.000	.932	1.073
	Q9:Value neigh-community	1.071	.277	.193	3.859	.000	.955	1.047
	Q107:Household income	.989	.256	.190	3.862	.000	.991	1.010
	Q46:Belong pol. clubs, orgs	4.998	1.593	.155	3.137	.002	.980	1.021
	Q104:Age	.975	.365	.135	2.669	.008	.928	1.077
6	(Constant)	12.049	2.842		4.240	.000		
	Q15:Value personal-pol. philosophy	1.258	.224	.283	5.616	.000	.926	1.080
	Q9:Value neigh-community	1.031	.276	.186	3.742	.000	.952	1.050

community								
Q107:Household income	1.027	.254	.197	4.037	.000	.987	1.013	
Q46:Belong pol. clubs, orgs	4.901	1.580	.152	3.101	.002	.979	1.021	
Q104:Age	1.084	.365	.150	2.971	.003	.915	1.092	
Q101:Hours listened to radio yesterday	.526	.209	.123	2.519	.012	.978	1.023	

Excluded Variables^a

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
1	Female	-.050 ^a	-.945	.345	-.054	.993	1.007	.993
	Q104:Age	.173 ^a	3.276	.001	.183	.956	1.046	.956
	Black	-.064 ^a	-1.218	.224	-.069	1.000	1.000	1.000
	Q1:Where live	-.005 ^a	-.089	.929	-.005	.997	1.003	.997
	Q2:Time lived there	.134 ^a	2.570	.011	.145	.994	1.006	.994
	Q107:Household income	.194 ^a	3.758	.000	.209	.995	1.006	.995
	Q9:Value neigh- community	.212 ^a	4.104	.000	.227	.981	1.020	.981
	Q10:Value religion	-.071 ^a	-1.342	.181	-.076	.991	1.009	.991
	Q11:Value ethnic-racial heritage	-.045 ^a	-.848	.397	-.048	.969	1.032	.969
	Q12:Value being American	-.011 ^a	-.209	.834	-.012	.973	1.028	.973
	Q46:Belong pol. clubs, orgs	.175 ^a	3.367	.001	.188	.987	1.014	.987
	Q101:Hours listened to radio yesterday	.106 ^a	2.018	.045	.114	.996	1.004	.996
2	Female	-.067 ^b	-1.307	.192	-.074	.986	1.014	.972
	Q104:Age	.143 ^b	2.711	.007	.153	.932	1.073	.932
	Black	-.060 ^b	-1.178	.240	-.067	.999	1.001	.980
	Q1:Where live	-.020 ^b	-.395	.693	-.022	.992	1.008	.975
	Q2:Time lived there	.091 ^b	1.728	.085	.098	.942	1.061	.930
	Q107:Household income	.197 ^b	3.927	.000	.218	.994	1.006	.975
	Q10:Value religion	-.130 ^b	-2.470	.014	-.139	.932	1.073	.922
	Q11:Value ethnic-racial heritage	-.103 ^b	-1.922	.056	-.109	.913	1.095	.913
	Q12:Value being American	-.072 ^b	-1.347	.179	-.077	.905	1.105	.905
	Q46:Belong pol. clubs, orgs	.174 ^b	3.425	.001	.192	.987	1.014	.968
	Q101:Hours listened to radio yesterday	.098 ^b	1.907	.057	.108	.995	1.005	.978
	3	Female	-.054 ^c	-1.058	.291	-.060	.981	1.019
Q104:Age		.145 ^c	2.818	.005	.159	.932	1.073	.932

3	Female	-.054 ^o	-1.058	.291	-.060	.981	1.019	.967
	Q104:Age	.145 ^o	2.818	.005	.159	.932	1.073	.932
	Black	-.020 ^o	-.397	.691	-.023	.956	1.046	.951
	Q1:Where live	-.011 ^o	-.210	.834	-.012	.990	1.011	.973
	Q2:Time lived there	.109 ^o	2.122	.035	.120	.935	1.069	.930
	Q10:Value religion	-.108 ^o	-2.084	.038	-.118	.919	1.088	.919
	Q11:Value ethnic-racial heritage	-.064 ^o	-1.201	.231	-.068	.877	1.140	.877
	Q12:Value being American	-.060 ^o	-1.140	.255	-.065	.902	1.109	.902
	Q46:Belong pol. clubs, orgs	.163 ^o	3.267	.001	.183	.983	1.017	.963
	Q101:Hours listened to radio yesterday	.109 ^o	2.178	.030	.123	.992	1.008	.972
4	Female	-.032 ^d	-.633	.527	-.036	.963	1.039	.958
	Q104:Age	.135 ^d	2.669	.008	.151	.928	1.077	.928
	Black	-.025 ^d	-.498	.619	-.028	.956	1.046	.948
	Q1:Where live	.006 ^d	.113	.910	.006	.980	1.021	.961
	Q2:Time lived there	.109 ^d	2.148	.033	.122	.935	1.069	.930
	Q10:Value religion	-.095 ^d	-1.845	.066	-.105	.913	1.095	.913
	Q11:Value ethnic-racial heritage	-.055 ^d	-1.038	.300	-.059	.874	1.144	.874
	Q12:Value being American	-.040 ^d	-.757	.449	-.043	.888	1.126	.888
	Q101:Hours listened to radio yesterday	.106 ^d	2.155	.032	.122	.992	1.009	.961
	5	Female	-.030 ^e	-.604	.547	-.035	.963	1.039
Black		.014 ^e	.265	.791	.015	.878	1.138	.853
Q1:Where live		-.016 ^e	-.319	.750	-.018	.954	1.048	.904
Q2:Time lived there		.071 ^e	1.314	.190	.075	.823	1.215	.817
Q10:Value religion		-.099 ^e	-1.954	.052	-.111	.912	1.096	.901
Q11:Value ethnic-racial heritage		-.053 ^e	-1.020	.308	-.058	.874	1.144	.874
Q12:Value being American		-.063 ^e	-1.201	.231	-.069	.866	1.155	.866
Q101:Hours listened to radio yesterday		.123 ^e	2.519	.012	.143	.978	1.023	.915
6		Female	-.029 ^f	-.595	.552	-.034	.963	1.039

6	Female	-.029 ^f	-.595	.552	-.034	.963	1.039	.915
	Black	.014 ^f	.272	.786	.016	.878	1.138	.842
	Q1:Where live	-.025 ^f	-.505	.614	-.029	.949	1.053	.889
	Q2:Time lived there	.058 ^f	1.076	.283	.062	.814	1.228	.799
	Q10:Value religion	-.088 ^f	-1.732	.084	-.099	.903	1.107	.896
	Q11:Value ethnic-racial heritage	-.057 ^f	-1.094	.275	-.063	.874	1.144	.874
	Q12:Value being American	-.065 ^f	-1.254	.211	-.072	.865	1.155	.865

a. Predictors in the Model: (Constant), Q15:Value personal-pol.philosophy

b. Predictors in the Model: (Constant), Q15:Value personal-pol.philosophy, Q9:Value neigh-community

c. Predictors in the Model: (Constant), Q15:Value personal-pol.philosophy, Q9:Value neigh-community, Q107:Household income

d. Predictors in the Model: (Constant), Q15:Value personal-pol.philosophy, Q9:Value neigh-community, Q107:Household income, Q46:Belong pol. clubs,orgs

e. Predictors in the Model: (Constant), Q15:Value personal-pol.philosophy, Q9:Value neigh-community, Q107:Household income, Q46:Belong pol. clubs,orgs, Q104:Age

f. Predictors in the Model: (Constant), Q15:Value personal-pol.philosophy, Q9:Value neigh-community, Q107:Household income, Q46:Belong pol. clubs,orgs, Q104:Age, Q101:Hours listened to radio yesterday

g. Dependent Variable: PP

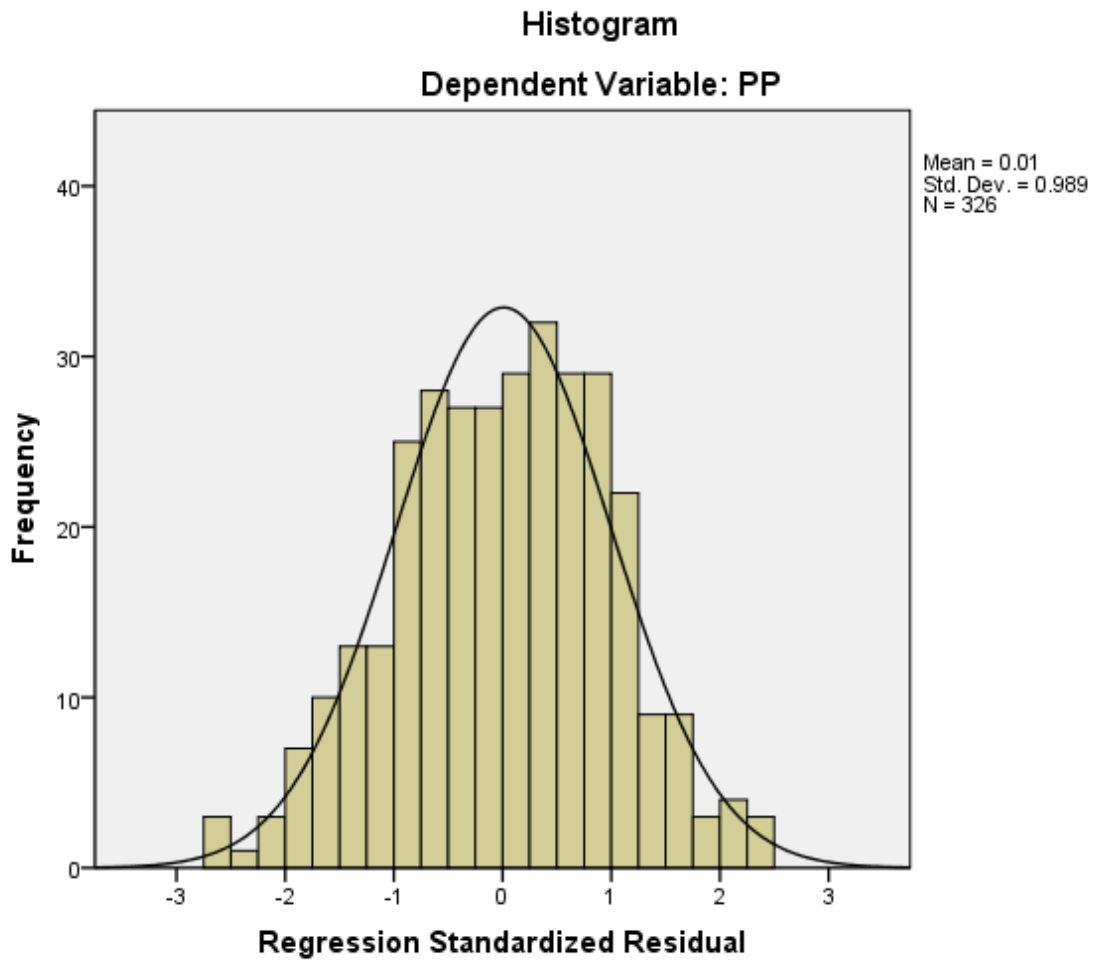
Collinearity Diagnostics^a

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions						
				(Constant)	Q15:Value personal-pol. philosophy	Q9:Value neigh-community	Q107: Household income	Q46:Belong pol. clubs, orgs	Q104:Age	Q101:Hours listened to radio yesterday
1	1	1.936	1.000	.03	.03					
	2	.064	5.490	.97	.97					
2	1	2.874	1.000	.01	.01	.01				
	2	.091	5.622	.03	.85	.26				
	3	.035	9.045	.96	.14	.73				
3	1	3.727	1.000	.00	.01	.01	.01			
	2	.152	4.955	.00	.14	.04	.84			
	3	.090	6.439	.02	.75	.32	.02			
	4	.032	10.870	.97	.11	.63	.13			
4	1	3.931	1.000	.00	.01	.00	.01	.01		
	2	.797	2.221	.00	.00	.00	.00	.98		
	3	.152	5.089	.00	.13	.04	.83	.00		
	4	.089	6.632	.02	.75	.32	.02	.01		
	5	.032	11.166	.97	.11	.63	.13	.00		
5	1	4.823	1.000	.00	.00	.00	.01	.01	.00	
	2	.805	2.448	.00	.00	.00	.00	.98	.00	
	3	.165	5.410	.00	.04	.02	.81	.00	.09	
	4	.097	7.043	.00	.80	.02	.00	.00	.34	
	5	.080	7.748	.02	.08	.47	.04	.01	.49	
	6	.030	12.685	.97	.07	.49	.13	.00	.07	
6	1	5.219	1.000	.00	.00	.00	.01	.01	.00	.01
	2	.811	2.537	.00	.00	.00	.00	.97	.00	.02
	3	.602	2.945	.00	.00	.00	.01	.02	.01	.91
	4	.164	5.637	.00	.04	.02	.80	.00	.10	.00
	5	.096	7.360	.00	.85	.03	.00	.00	.27	.01
	6	.078	8.158	.02	.04	.48	.05	.00	.53	.03
	7	.030	13.278	.97	.07	.47	.14	.00	.08	.01

a. Dependent Variable: PP

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	20.6177	54.5774	39.5053	6.34981	326
→ Residual	-26.68184	24.33372	.08676	9.76939	326
Std. Predicted Value	-3.084	2.418	-.024	1.029	326
Std. Residual	-2.701	2.463	.009	.989	326



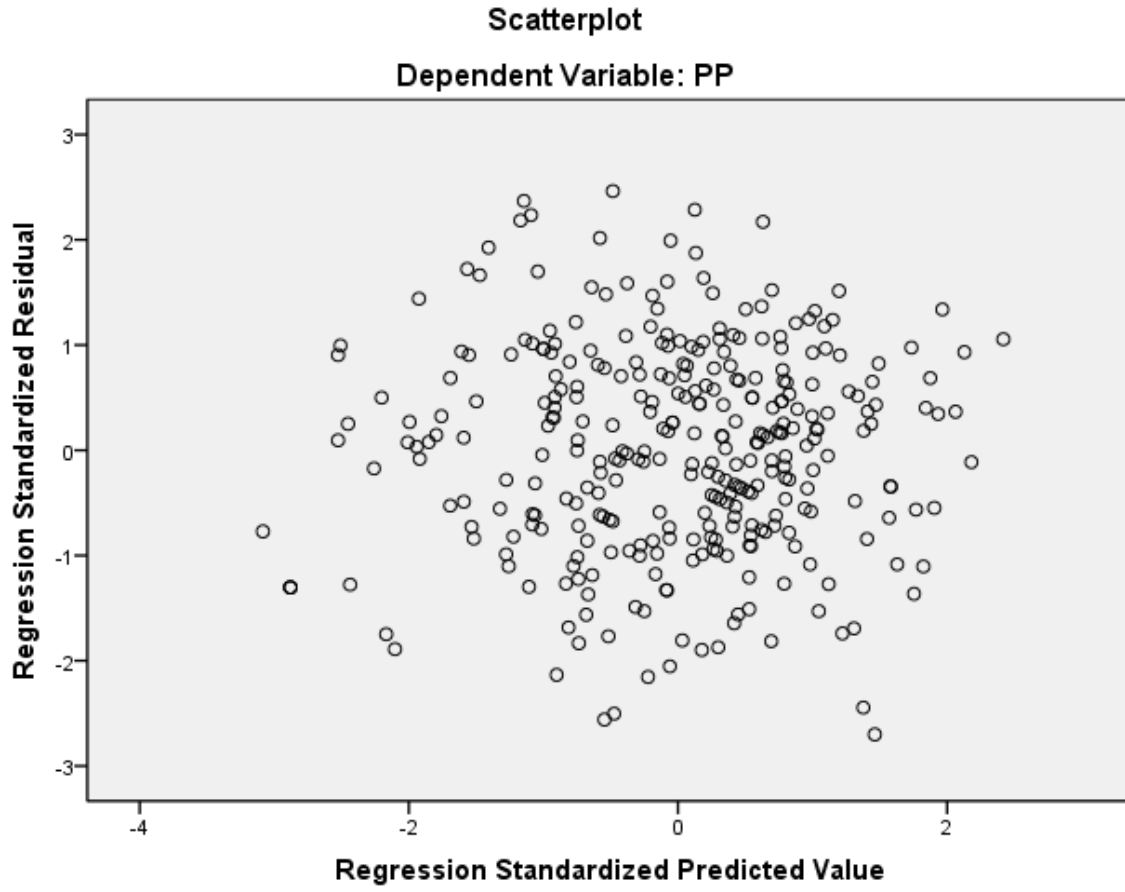


Table 1
Stepwise Multiple Regression Predicting Political Participation

Model	Predictor Variable	r	Final Beta	R^2 Change
1	Q 15: Value of Political Philosophy	.379**	.283**	.144**
2	Q9 Value Neighborhood Community	.261**	.186**	.044**
3	Q 107 Household Income	.221**	.197**	.039**
4	Q 46 Political club	.217**	.152*	.026**
5	Q 104 Age	.245**	.150*	.017**
6	Q 101 Hours listened To radio yesterday	.128*	.123*	.015*

Total Equation:
 $R^2 = .285$ Adjusted $R^2 = .271$, $p < .001$

Note: * $p < .05$. ** $p < .01$

V. Write-up of Results:

The stepwise regression inserted six of the original fourteen variables in the final model. All six variables have beta values that are significant at the 0.05 level; while most are significant at 0.01 or even 0.001 (p value).

The overall model fit is good, with an R^2 of 0.285. This means that this model accounts for 28.5% of the variance in Political Participation. The number of cases for this test is limited to 312. Of the demographic variables included initially, only household income and age show up in the final model. Value for personal philosophy is a strong unique indicator of Political Participation ($\beta = .28, p < .001$) (when controlling for all other variables in the equation). This is an indication that personal feelings and philosophy play an important role in choosing candidates.

Value for neighborhood ($\beta = .19, p < .001$) is also a strong indicator that shows as the value of a neighborhood increases, so does political participation, when controlling for the other five independent variables. In addition, household income ($\beta = .20, p < .001$) is significant in that it shows as income increases so does political participation holding other variables constant.

Another significant variable, belonging to political clubs and organizations ($\beta = .15, p < .005$) indicates belonging to a political group is uniquely important to Political Participation. In addition, Age ($\beta = .15, p < .005$) is significant in that it shows older people are more involved in political events than younger people, when controlling for other variables. Also, hours listened to the radio yesterday ($\beta = .12, p < .05$), is a significant unique predictor in that it shows as more people listen to the radio, Political Participation increases. Overall, holding other variables

constant, political philosophy is the most important predictor of Political Participation. Other factors such as neighborhood values, income, political affiliations, age, and hours spent listening to radio are also important.