**K-Means Cluster Analysis of Pew Survey Data**

# Intro:

Discussion of the polarization of American political opinion has been the hot topic of political science in recent years. Data has suggested that Americans are more and more inclined to identify with either one of the main political parties, leading to a sense of a widening philosophical gap in the center of public opinion as moderates and independents appear to disappear. Beyond that, the focal points of our political parties have come to embody viewpoints that lie either far right or far left on the Conservative-Liberal scale. Pundits and commentators take these diverging figureheads and use them as models to infer the distribution of American public opinion.

The issue with this trend is that it tends to discount moderate viewpoints as insignificant due to the center’s apparent decline in size and importance. Despite this sense, the spectrum of political ideology is much more diverse than political discourse suggests. Social and political interaction has been shown to play an important role in the formation of a person’s ideology as does news and media. These interactions can account for the growing number of individuals associating their values with a political party but not necessarily for any substantive change in ideology. Therefore, in order to truly value whether and how polarization is affecting American society, it is necessary to map ideological groupings that can more accurately portray the spectrum of public opinion.

In this paper, I will be looking at the space of political ideology analyzing the data used in Pew Research Bureau’s Political Typology Survey (2011) and running K-means cluster analyses. My research goal would be to look at the political ideology of Americans in order to classify and identify areas (clusters, silo’s etc) of public opinion in the United States. The identification of clusters has many practical implications. First and foremost, changes in the underlying distribution greatly affects the assumptions of political organizers and politicians concerning their views of the electorate. Analyses such as these give insight to the mentalities of citizens and voters’ issue attitudes go together on an ideological level. Additionally, it would provide insight into the existence of a polarization trend in American politics.

# Variables and measurement:

The variable of question in this project concerns the 19 variables originally used to create the political typology. These variables correspond to nine aspects of political ideology:

* Government Performance – The respondent’s association of positive or negative feeling associated with the administration of government.
* Religion and Mortality – The respondent’s belief in or assigned importance to religions affiliation or devotion.
* Business – The respondent’s emotional association with the trustfulness and impact of large businesses in the United States.
* Environmentalism – The respondent’s support or ambivalence towards environmental regulation.
* Immigration – The respondents view of immigration law and the flow of (legal) immigrants into the United States.
* Race – The respondent’s belief as race being a factor in a citizen’s daily life.
* Social Safety Net – The respondent’s support for or opposition to the social safety net.
* Foreign Policy Assertiveness – The respondent’s preference for either diplomacy or assertive action with regards to foreign relations.
* Financial Security – The respondent’s personal feeling of financial security.

All the variables were measured on an ordinal scale. Respondents were asked to associate with one of two opposed statements, and then asked to value that association as either “Strongly” or “Not Strongly.” They were also given the option to respond neither, both equally, or with nonresponse. In order to define the clusters on only politically salient individuals, the study also used measures of political activism based on voter registration, voter frequency, and whether they follow government and public affairs to define a separate cluster of bystanders.

# Initial Models

In order to test the first hypothesis, the survey responses will be recoded on an ordinal scale and each used as a level in a k-means cluster analysis. “K-means analysis is a divisive, non-hierarchical method of defining clusters. This is an iterative process, which means that at each step the membership of each individual in a cluster is reevaluated based on the current centers of each existing cluster.” (Peebles, 2011) This process can be repeated until a desired number of clusters is reached, or a level of clusters can be chosen such that the addition of an additional cluster does not significantly contribute to a decrease in error. This process is non-hierarchical due to the ability of each individual point to be reassigned to a different cluster at each stage in the analysis. “Clusters are defined based on Euclidean distances so as to reduce the variability of individuals within a cluster, while maximizing the variability between clusters. (Peebles, 2011) This method of analysis will provide cluster assignments to each data in addition to defining average values that can be used to define each cluster’s ideological markings

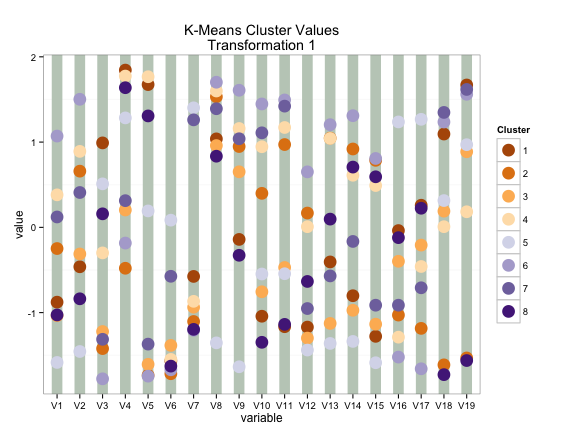
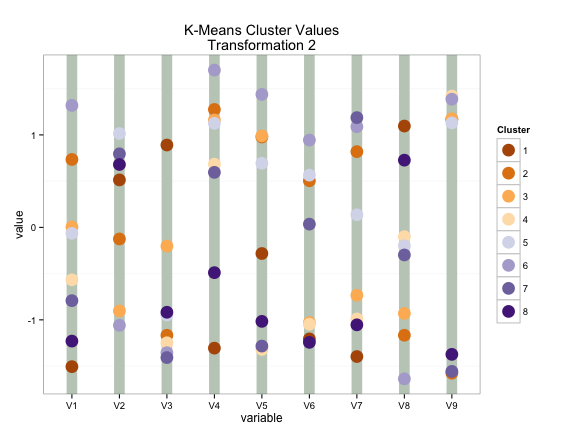
In order to find the best method for the cluster analysis, I used four data transformations. The first data transformation used all nineteen survey response questions as dimensions for the clusters and coded nonresponse as NA, causing for some data loss. The second transformation, averaged the survey responses in the same category and used the 9 categories as the dimensions of the cluster analysis, decreasing the amount of data loss. The third transformation used the nineteen survey responses, but coded the nonresponse as 0. The fourth and final transformation again averaged the survey responses again, but while using the 0-coded nonresponse.

# Finals Models

In the initial survey, each of the eight clusters was then used to identify one of the following clusters defined by Pew in their Political Typology:

* Staunch Conservatives: This extremely partisan Republican group is strongly conservative on economic and social policy and favors an assertive foreign policy. They are highly engaged in politics.
* Main Street Republicans: Concentrated in the South and Midwest. Main Street Republicans differ from Staunch Conservatives in the degree of their conservatism and in their skepticism about business. They are socially and fiscally conservative but supportive of government efforts to protect the environment.
* Libertarians: This Republican-oriented, predominantly male group mostly conforms to the classic profile of the libertarian in its combination of strong economic conservatism and relatively liberal views on social issues. Much less religious than other GOP-oriented groups, Libertarians are relatively comfortable financially.
* Disaffecteds: The most financially stressed of the eight typology groups, Disaffecteds are very critical of both business and government. They are sympathetic to the poor and supportive of social welfare programs. Most are skeptical about immigrants and doubtful that the U.S. can solve its current problems. They are pessimistic about their own financial future.
* Post-Moderns: Well-educated and financially comfortable. Post-Moderns are supportive of many aspects of government though they take conservative positions on questions about racial policy and the social safety net. Very liberal on social issues. Post-Moderns were strong supporters of Barack Obama in 2008, but turned out at far lower rates in 2010.
* New Coalition Democrats: This majority-minority group is highly religious and financially stressed. They are generally upbeat about both the country’s ability to solve problems and an individual’s ability to get ahead through hard work.
* Hard Pressed Democrats: This largely blue-collar Democratic group is struggling financially and is generally cynical about government. Nearly half expect that they will not earn enough to lead the kind of life they want. Socially conservative and very religious.
* Solid Liberals: Politically engaged, Solid Liberals are strongly pro-government and hold liberal positions across the full range of political issues. They are one of the most secular groups.
* Bystanders: Defined by their disengagement from the political process, either by choice or because they are ineligible to vote. They are highly unlikely to vote. Most follow government and public affairs only now and then or hardly at all.

(Pew 2014b)

# Conclusion

# Appendix A: R Code

**Data Transformation:**

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| #Upload data into R dataframe  #------------------------------------------------------------------------------------#  library(foreign)  df2011 <- read.spss("/Users/JonathanCampbell/Desktop/Pew Typology/Pew's 2011 Typology Survey/2011 Political Typology Survey/2011 Political Typology public.sav",to.data.frame=TRUE)  #Create subset for manipulation and analysis  #------------------------------------------------------------------------------------#  #subset cluster variables based off of: http://www.people-press.org/2011/05/04/about-the-political-typology/  cvar <- c("mergeid", "q17a", "q17b", "q37u", "q37w", "q37aa", "q17m", "q17n", "q37q", "q37r",  "q17g", "q37dd", "q17f", "q37hh", "q17c", "q17d", "q17i", "q37bb", "q37y", "q37z")  df <- subset(df2011, df2011$bys == 0, select = cvar)  #Data transformation No. 1  #------------------------------------------------------------------------------------#  #recode variables on an ordinal scale  library(plyr)  df1<-matrix(nrow=2818,ncol=20)  for (i in 1:20){  df1[,i] <- mapvalues(df[,i], from = levels(df[,2]), to = c(1,2,5,4,3,NA))}  #step above does not work, converts factor levels to factor level defined by to  #to fix switch the level 3 and 5  for (i in 1:20){  df1[,i] <- mapvalues(df1[,i], from = c(5,3), to = c(3,5))}  #change to a -2 to +2 scale  for (i in 1:20){  df1[,i] <- mapvalues(df1[,i], from = c(1:5,NA), to = c(-2,-1,0,1,2,NA))}  #recode individual questions so they are on the same/comparable value scales  recode <- c(1,1,-1,1,-1,1,1,1,-1,1,-1,1,-1,1,1,-1,-1,-1,-1,1)  for (i in 1:20){  df1[,i]<- recode[i]\*df1[,i]}  #Data transformation No. 2  #------------------------------------------------------------------------------------#  #Make a matrix of NA positions for summed totals  dfna<-matrix(nrow=2818,ncol=10)  dfna[, 1] =is.na(df1[, 1])  dfna[, 2] =is.na(df1[, 2])+is.na(df1[, 3])  dfna[, 3] =is.na(df1[, 4])+is.na(df1[, 5])+is.na(df1[, 6])  dfna[, 4] =is.na(df1[, 7])+is.na(df1[, 8])  dfna[, 5] =is.na(df1[, 9])+is.na(df1[,10])  dfna[, 6] =is.na(df1[,11])+is.na(df1[,12])  dfna[, 7] =is.na(df1[,13])+is.na(df1[,14])  dfna[, 8] =is.na(df1[,15])+is.na(df1[,16])  dfna[, 9] =is.na(df1[,17])+is.na(df1[,18])  dfna[,10] =is.na(df1[,19])+is.na(df1[,20])  #recode column to account for 3 columns  dfna[, 3]=mapvalues(dfna[,3], from = c(0,1,2,3), to = c(0,1,1,2))  #recode so that only locations that are both NA's will be NA  for (i in 1:10){  dfna[,i]=mapvalues(dfna[,i], from = c(0,1,2), to = c(0,0,NA))}  #Create new dataframe of summed values  #takes the mean of the values (rm NA) and adds the value of the NA matrix  df2<-matrix(nrow=2818,ncol=10)  for (i in 1:2818){  df2[i, 1]=df1[i,1]  df2[i, 2]=sum(mean(c(df1[i, 2],df1[i, 3]),na.rm=TRUE),dfna[i,2])  df2[i, 3]=sum(mean(c(df1[i, 4],df1[i, 5],df1[i,6]),na.rm=TRUE),dfna[i,3])  df2[i, 4]=sum(mean(c(df1[i, 7],df1[i, 8]),na.rm=TRUE),dfna[i,4])  df2[i, 5]=sum(mean(c(df1[i, 9],df1[i,10]),na.rm=TRUE),dfna[i,5])  df2[i, 6]=sum(mean(c(df1[i,11],df1[i,12]),na.rm=TRUE),dfna[i,6])  df2[i, 7]=sum(mean(c(df1[i,13],df1[i,14]),na.rm=TRUE),dfna[i,7])  df2[i, 8]=sum(mean(c(df1[i,15],df1[i,16]),na.rm=TRUE),dfna[i,8])  df2[i, 9]=sum(mean(c(df1[i,17],df1[i,18]),na.rm=TRUE),dfna[i,9])  df2[i,10]=sum(mean(c(df1[i,19],df1[i,20]),na.rm=TRUE),dfna[i,10])  }  #Data transformation No. 3  #------------------------------------------------------------------------------------#  df3<-matrix(nrow=2818,ncol=20)  #map NA values to zero  for (i in 1:20){  df3[,i] <- mapvalues(df1[,i], from = c(NA), to = c(0))}  #Data transformation No. 4  #------------------------------------------------------------------------------------#  df4<-matrix(nrow=2818,ncol=10)  for (i in 1:2818){  df4[i, 1]=df3[i,1]  df4[i, 2]=mean(c(df3[i, 2],df3[i, 3]),na.rm=FALSE)  df4[i, 3]=mean(c(df3[i, 4],df3[i, 5],df3[i,6]),na.rm=FALSE)  df4[i, 4]=mean(c(df3[i, 7],df3[i, 8]),na.rm=FALSE)  df4[i, 5]=mean(c(df3[i, 9],df3[i,10]),na.rm=FALSE)  df4[i, 6]=mean(c(df3[i,11],df3[i,12]),na.rm=FALSE)  df4[i, 7]=mean(c(df3[i,13],df3[i,14]),na.rm=FALSE)  df4[i, 8]=mean(c(df3[i,15],df3[i,16]),na.rm=FALSE)  df4[i, 9]=mean(c(df3[i,17],df3[i,18]),na.rm=FALSE)  df4[i,10]=mean(c(df3[i,19],df3[i,20]),na.rm=FALSE)  } |

**Cluster Analysis:**

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| #Starting points for each cluster  #------------------------------------------------------------------------------------#  library(psych)  library(cluster)  #omit lines that contain a NA and subset  sub1=na.omit(df1)[,2:20]  sub=sub1[,2:20]  sub2=na.omit(df2)[,2:10]  sub=sub2[,2:10]  sub3=na.omit(df3)[,2:20]  sub=sub3[,2:20]  sub4=na.omit(df4)[,2:10]  sub=sub4[,2:10]  ####################################################################  #Cluster Analysis for Data transformations (repeated with sub2:sub4)  #------------------------------------------------------------------------------------#  fit <- kmeans(sub1, 8) ### 8 k cluster solution ###  aggregate(sub1,by=list(fit$cluster),FUN=mean) ### get cluster means ###  table1<-data.frame(aggregate(sub1,by=list(fit$cluster),FUN=mean))  fit ### see what cluster command did in detail ###  sub1 <- data.frame(sub1, fit$cluster) ### append cluster assignment ###  head(sub1) ### look at the dataset again ### |

**Graphics:**

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| #create plot of cluster explanatory power  wss <- (nrow(sub)-1)\*sum(apply(sub,2,var))  for (i in 2:15) wss[i] <- sum(kmeans(sub, centers=i)$withinss)  plot(1:15, wss, type="b", xlab="Number of Clusters",  ylab="Within groups sum of squares")  ### see where the "elbow" is in the number of clusters ###  ####################################################################  #Inset plots of clusters standardized or corrected  k.rand <- function(x){  km.rand <- matrix(sample(x),dim(x)[1],dim(x)[2])  rand.wss <- as.matrix(dim(x)[1]-1)\*sum(apply(km.rand,2,var))  for (i in 2:15) rand.wss[i] <- sum(kmeans(km.rand, centers=i, iter.max=50, nstart=10)$withinss)  rand.wss <- as.matrix(rand.wss)  return(rand.wss)}  k.1 <- function(x) {  for (i in 1:250) {  r.mat <- as.matrix(suppressWarnings(k.rand(sub)))  rand.mat[,i] <- r.mat}  return(rand.mat)}  rand.mat <- matrix(0,15,250)  rand.mat <- k.1(sub)  xrange <- range(1:15)  yrange <- range(log(rand.mat),log(wss))  plot(xrange,yrange, type='n', xlab='Cluster Solution', ylab='Log of Within Group SSE', main='Cluster Solutions against Log of SSE')  for (i in 1:250) lines(log(rand.mat[,i]),type='l',col='red')  lines(log(wss), type="b", col='blue')  legend('topright',c('Actual Data', '250 Random Runs'), col=c('blue', 'red'), lty=1)  yrange <- range(rand.mat,wss)  plot(xrange,yrange, type='n', xlab="Cluster Solution", ylab="Within Groups SSE", main="Cluster Solutions against SSE")  for (i in 1:250) lines(rand.mat[,i],type='l',col='red')  lines(1:15, wss, type="b", col='blue')  legend('topright',c('Actual Data', '250 Random Runs'), col=c('blue', 'red'), lty=1)  # Calculate the mean and standard deviation of difference between SSE of actual data and SSE of 250 randomized datasets  r.sse <- matrix(0,dim(rand.mat)[1],dim(rand.mat)[2])  wss.1 <- as.matrix(wss)  for (i in 1:dim(r.sse)[2]) {  r.temp <- abs(rand.mat[,i]-wss.1[,1])  r.sse[,i] <- r.temp}  r.sse.m <- apply(r.sse,1,mean)  r.sse.sd <- apply(r.sse,1,sd)  r.sse.plus <- r.sse.m + r.sse.sd  r.sse.min <- r.sse.m - r.sse.sd  xrange <- range(1:15)  yrange <- range(log(r.sse.plus),log(r.sse.min))  plot(xrange,yrange, type='n',xlab='Cluster Solution', ylab='Log of SSE - Random SSE', main='Cluster Solustions against (Log of SSE - Random SSE)')  lines(log(r.sse.m), type="b", col='blue')  lines(log(r.sse.plus), type='l', col='red')  lines(log(r.sse.min), type='l', col='red')  legend('bottomright',c('SSE - random SSE', 'SD of SSE-random SSE'), col=c('blue', 'red'), lty=1)  xrange <- range(1:15)  yrange <- range(r.sse.plus,r.sse.min)  plot(xrange,yrange, type='n',xlab='Cluster Solution', ylab='SSE - Random SSE', main='Cluster Solutions against (SSE - Random SSE)')  lines(r.sse.m, type="b", col='blue')  lines(r.sse.plus, type='l', col='red')  lines(r.sse.min, type='l', col='red')  legend('bottomright',c('SSE - random SSE', 'SD of SSE-random SSE'), col=c('blue', 'red'), lty=1)  #Graph of cluster centers by transformation for 8 clusters, repeated with table2:table4  library(reshape)  dfplotck <- melt(table1,id.vars=c("Group.1"))  ggplot(dfplotck, aes(x=variable, y=value, color=as.factor(Group.1))) +  geom\_point(size=6) + theme\_bw() +  theme( # remove the horizontal grid lines  panel.grid.major.y = element\_blank() ,  # explicitly set the vertical lines (or they will disappear too)  panel.grid.major.x = element\_line( size=5, color="honeydew3")  ) + scale\_colour\_brewer(palette="PuOr") +  labs(title="K-Meals Cluster Values\nTransformation 1", color = "Cluster") |

# Appendix B: Cluster Means Tables

## Transformation 1

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **V1** | **V2** | **V3** | **V4** | **V5** | **V6** | **V7** | **V8** | **V9** | **V10** |
| **1** | -0.87735 | -0.46226 | 0.99056 | 1.84433 | 1.67452 | -1.566037 | -0.57547 | 1.03773 | -0.14150 | -1.04245 |
| **2** | -0.24855 | 0.65895 | -1.42196 | -0.47976 | -1.73410 | -1.716763 | -1.10404 | 1.53179 | 0.94797 | 0.39884 |
| **3** | -1.03619 | -0.31221 | -1.22171 | 0.20361 | -1.60633 | -1.384615 | -0.93665 | 0.95927 | 0.65158 | -0.75565 |
| **4** | 0.38132 | 0.89105 | -0.29961 | 1.77431 | 1.76653 | -1.548638 | -0.86770 | 1.59922 | 1.15953 | 0.94552 |
| **5** | -1.58445 | -1.45608 | 0.51013 | 1.28378 | 0.19256 | 0.084459 | 1.40202 | -1.35472 | -1.63513 | -0.54729 |
| **6** | 1.07058 | 1.50196 | -1.77647 | -0.18431 | -1.74509 | -1.670588 | -1.20784 | 1.70196 | 1.60784 | 1.44705 |
| **7** | 0.12173 | 0.40869 | -1.31304 | 0.31304 | -1.36956 | -0.573913 | 1.26086 | 1.39130 | 1.03913 | 1.10869 |
| **8** | -1.02758 | -0.83793 | 0.15862 | 1.63793 | 1.30689 | -1.627586 | -1.19655 | 0.83448 | -0.32758 | -1.34827 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **V11** | **V12** | **V13** | **V14** | **V15** | **V16** | **V17** | **V18** | **V19** |
| **1** | -1.16509 | -1.1698113 | -0.405660 | -0.80188 | -1.27830 | -0.037735 | 0.25943 | 1.0943396 | 1.66981 |
| **2** | 0.97109 | 0.1676300 | 1.046242 | 0.91907 | 0.78612 | -1.028901 | -1.18497 | -1.6127167 | -1.53179 |
| **3** | -0.47058 | -1.2986425 | -1.126696 | -0.97285 | -1.13574 | -0.398190 | -0.20814 | 0.1900452 | 0.88687 |
| **4** | 1.17120 | 0.0077821 | 1.042801 | 0.61089 | 0.49027 | -1.287937 | -0.45914 | 0.0077821 | 0.18287 |
| **5** | -0.54391 | -1.4391891 | -1.361486 | -1.33783 | -1.58783 | 1.236486 | 1.26689 | 0.3141891 | 0.96959 |
| **6** | 1.49411 | 0.6509803 | 1.203921 | 1.30980 | 0.80784 | -1.521568 | -1.65882 | 1.2352941 | 1.56078 |
| **7** | 1.42173 | -0.9521739 | -0.569565 | -0.16521 | -0.91304 | -0.913043 | -0.70869 | 1.3478260 | 1.61739 |
| **8** | -1.13793 | -0.6344827 | 0.096551 | 0.70689 | 0.59310 | -0.120689 | 0.22413 | -1.7275862 | -1.56206 |

## Transformation 2

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **V1** | **V2** | **V3** | **V4** | **V5** | **V6** | **V7** | **V8** | **V9** |
| **1** | -0.82567 | 0.14495 | -1.352490 | 0.87739 | 0.94827 | -0.394636 | -0.26053 | 0.239463 | -0.95210 |
| **2** | -1.41600 | 0.98666 | -1.004000 | -0.81600 | -1.58600 | -1.384000 | -0.97600 | 0.978000 | -1.37600 |
| **3** | 1.07702 | -0.75042 | -1.387626 | 1.63257 | 1.37752 | 1.039141 | 1.08080 | -1.444444 | 1.56944 |
| **4** | 0.16578 | -0.58377 | -0.093421 | 1.24342 | 1.03421 | -0.777631 | -0.79078 | -1.047368 | 1.38026 |
| **5** | -0.54450 | 0.76701 | -1.339005 | 0.81282 | -1.21727 | -0.854712 | -0.89267 | 0.035340 | 1.45157 |
| **6** | 1.02768 | -0.17762 | -1.264705 | 1.45847 | 1.13667 | 0.908304 | 1.10207 | -1.375432 | -1.34429 |
| **7** | -0.51880 | 0.81086 | -1.285266 | 0.66771 | -1.50156 | -0.059561 | 1.23667 | -0.652037 | -1.50626 |
| **8** | -1.51023 | 0.50554 | 0.983375 | -1.34015 | -0.29539 | -1.194373 | -1.43606 | 1.030690 | 1.17007 |

## Transformation 3

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **V1** | **V2** | **V3** | **V4** | **V5** | **V6** | **V7** | **V8** | **V9** | **V10** |
| **1** | -1.50000 | -1.06953 | 0.91059 | 1.58940 | 0.99668 | -1.42384 | -0.26821 | -0.40397 | -0.97019 | -1.20860 |
| **2** | -0.78888 | -0.54166 | -0.28888 | 1.35277 | 1.00277 | -1.54722 | -1.24722 | 1.34722 | 0.05000 | -1.21388 |
| **3** | -0.77313 | -0.53134 | 0.88955 | 1.75522 | 1.38507 | -1.44477 | -0.72238 | 0.99402 | 0.10149 | -0.96119 |
| **4** | -1.59791 | -1.40731 | 0.16187 | 1.13577 | -0.14621 | 0.30809 | 1.51958 | -1.21148 | -1.51174 | -0.26631 |
| **5** | 0.35890 | 0.93698 | -0.12054 | 1.70136 | 1.76164 | -1.44383 | -0.63561 | 1.54246 | 0.99726 | 0.90410 |
| **6** | 0.35714 | 0.50595 | -1.31547 | 0.56547 | -1.43154 | -0.69345 | 0.93750 | 1.54761 | 1.23511 | 0.88988 |
| **7** | 0.88564 | 1.53527 | -1.70072 | -0.21897 | -1.77615 | -1.75182 | -1.27493 | 1.67153 | 1.60340 | 1.38199 |
| **8** | -1.23926 | -0.22392 | -1.40490 | -0.11042 | -1.60736 | -1.47546 | -0.93865 | 1.06748 | 0.57668 | -0.38036 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **V11** | **V12** | **V13** | **V14** | **V15** | **V16** | **V17** | **V18** | **V19** |
| **1** | -1.112582 | -1.374172 | -1.13576 | -0.764900 | -0.84105 | 0.64900 | 0.97682 | -1.678807 | -1.09933 |
| **2** | -0.769444 | -0.091666 | 0.66111 | 1.308333 | 1.21388 | -0.61666 | -0.26388 | -1.650000 | -1.60000 |
| **3** | -1.077611 | -1.179104 | -0.56119 | -0.832835 | -1.13134 | -0.13134 | 0.18805 | 1.319402 | 1.67462 |
| **4** | -0.313315 | -1.279373 | -1.12793 | -1.195822 | -1.57180 | 1.19843 | 1.07310 | 0.843342 | 1.40208 |
| **5** | 1.052054 | -0.084931 | 1.11232 | 0.517808 | 0.31506 | -1.17534 | -0.28767 | 0.019178 | 0.20821 |
| **6** | 1.273809 | -0.726190 | -0.38392 | -0.035714 | -0.75892 | -0.93452 | -0.83630 | 1.562500 | 1.63988 |
| **7** | 1.454987 | 0.678832 | 1.19464 | 1.299270 | 0.93673 | -1.53771 | -1.58394 | 0.221411 | 0.63746 |
| **8** | 0.027607 | -1.144171 | -0.66257 | -0.613496 | -0.81901 | -0.58588 | -0.45092 | -0.423312 | 0.47546 |

## Transformation 4

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **V1** | **V2** | **V3** | **V4** | **V5** | **V6** | **V7** | **V8** | **V9** |
| **1** | -1.5061425 | 0.51351 | 0.89066 | -1.30589 | -0.28255 | -1.206388 | -1.39680 | 1.09582 | 1.1670 |
| **2** | 0.7344632 | -0.12523 | -1.16666 | 1.27542 | 0.97740 | 0.504237 | 0.81920 | -1.16666 | -1.5762 |
| **3** | 0.0041322 | -0.90358 | -0.20247 | 1.16115 | 0.98898 | -1.028925 | -0.73415 | -0.93112 | 1.1749 |
| **4** | -0.5666666 | 0.67729 | -1.24782 | 0.68405 | -1.32028 | -1.047826 | -0.98985 | -0.10000 | 1.4202 |
| **5** | -0.0648734 | 1.01476 | -0.94778 | 1.12500 | 0.69303 | 0.564873 | 0.13607 | -0.19778 | 1.1297 |
| **6** | 1.3188202 | -1.05898 | -1.35533 | 1.70084 | 1.43820 | 0.943820 | 1.08848 | -1.63764 | 1.3862 |
| **7** | -0.7923976 | 0.79532 | -1.40789 | 0.59502 | -1.28362 | 0.035087 | 1.18713 | -0.29824 | -1.5570 |
| **8** | -1.2298507 | 0.67960 | -0.91791 | -0.48955 | -1.01641 | -1.243283 | -1.05373 | 0.72686 | -1.3731 |

# Appendix C: Survey Questions

**Government Performance**

Q.17 a 1 Government is almost always wasteful and inefficient [OR]

Q.17 a 2 Government often does a better job than people give it credit for

Q.17 b 1 Government regulation of business is necessary to protect the public interest

Q.17 b 2 Government regulation of business usually does more harm than good

**Religion and Morality**

Q.37 u 1 homosexuality should be accepted by society

Q.37 u 2 homosexual should be discouraged

Q.37 w 1 religion is important

Q.37 w 2 religion not that important

**Business**

Q.37 aa 1 it is not necessary to believe in God to have good morals

Q.37 aa 2 it is necessary to believe in God for good morals

Q.17 m 1 power concentrated in few companies

Q.17 m 2 large companies don't have too much power

Q.17 n 1 business make too much profit

Q.17 n 2 companies make a fair amount of money

**Environmentalism**

Q.37 q 1 countries should do what ever it takes to protect environment

Q.37 q 2 country has gone too far to protect environment

Q.37 r 1 Stricter laws cost too many jobs and hurt the economy

Q.37 r 2 stricter environmental regs are worth the costs

**Immigration**

Q.17 g 1 immigrants strengthen economy from hard work and talent

Q.17 g 2 immigrants are a burden because they take jobs housing

Q.37 dd 1 growing numbers of newcomers from other countries threaten American customs and values

Q.37 dd 2 growing number of newcomers from other countries strengthen American society

**Race**

Q.17 f 1 racial discrimination is the main reason that many blacks can't get ahead

Q.17 f 2 black who can't get ahead are responsible for their own condition

Q.37 hh 1 our country has made the changes to give blacks equal rights with whites

Q.37 hh 2 our country needs to continue to make changer to give blacks equal rights with whites

**Social Safety Net**

Q.17 c 1 poor people have it easy because they get government benefits without doing anything in return

Q.17 c 2 poor people have hard lives because govt benefits don't go far enough to help them live decently

Q.17 d 1 govt should do more to help needy by going deeper in debt

Q.17 d  2 the govt can't afford to do much more to help the needy

**Foreign Policy Assertiveness**

Q.17 i 1 the best way to insure peace is through military strength

Q.17 i 2 good diplomacy is best to secure peace

Q.37 bb 1 using overwhelming military strength is best to defeat terrorism

Q.37 bb 2 relying too much on military force to defeat terrorism creates hatred that leads to more terrorism

**Financial Security**

Q.37 y 1 I'm generally satisfied with the way things are going finically

Q.37 y 2 I'm not very satisfied with my financial situation

37 z 1 I often don't have enough money to make ends meet

37 z 2 paying the bills is generally not a problem for me