

# **Beyond the Left-Right Cleavage: Exploring American Political Choice Space**

*Melvin Hinich<sup>1</sup>, Xinsheng Liu<sup>2</sup>, Arnold Vedlitz<sup>2</sup>, Charles Lindsey<sup>3</sup>*

## Authors' Information:

<sup>1</sup>Department of Government and Department of Economics, University of Texas, Austin, Texas

<sup>2</sup>Institute for Science, Technology and Public Policy, Bush School of Government and Public Service, Texas A&M University, College Station, Texas

<sup>3</sup>Department of Statistics, Texas A&M University, College Station, Texas

## **Beyond the Left-Right Cleavage: Exploring American Political Choice Space**

Since Anthony Downs' *Economic Theory of Democracy* (1957), many theoretical and empirical studies have advanced our understanding of American political choice space. While there is little doubt about the existence and prominence of the left-right political economy dimension, there are debates about whether additional dimension(s) exists, and if so, the nature of the additional dimension(s).

Following Chapter 9 of Enelow and Hinich (1984) we apply a statistical methodology created by Cahoon and Hinich (1976) (see also Cahoon, Hinich and Ordeshook 1978 and Hinich 2004) to data from a national survey in order to probe the two dimensional latent political choice space in American political competition. Our results support the argument presented in **Hinich, Shaw and Huang (2010)** that in addition to the traditional left-right political economy continuum there is a second dimension that is driven by a cleavage among different reform prospects, ranging from progressive reform to status-quo to divisive change. Implications of the reform dimension in American politics are discussed in conclusion.

### **1 Spatial Choice Theory and MAP Algorithm**

Following Hinich and Munger (1994) we assume that the political space is a commonly held simplification of the complex network of government policies and political issues. Most citizens pay little attention to politics since they have little influence on what their government does. The vote totals of an election can result in a change of government that will produce significant policy changes but usually a change of government has scant impact on people's lives.

Political interest groups, on the other hand, have a vested interest in keeping in close touch with the executive branch as well as committees in the legislature that affect their issues. A political interest group that has a business base also lobbies the bureaucracies that regulate the actions of the

businesses that belong to the group. In some cases these interest groups attempt to influence public opinion by running advertisements in newspapers and on television. The social and economic networks in a democracy thus help form a link between the ideological positions of parties in the political space and issues that are relevant for voters.<sup>i</sup>

The mathematical model of this linkage in the spatial theory of electoral politics stipulates that there is a linear relationship between the points in the latent political space and positions in the space of issues on which voters have preferences. There may be several at different levels of complexity for a given individual.

Suppose that all voters have quadratic utility functions whose maximum is at their ideal positions in the issue space. To simplify this exposition suppose that there are only two important issues. Voter  $v$ 's quadratic utility for party  $p$ 's policy position  $\theta_p$  in the policy space is of the form  $U_v(\boldsymbol{\theta}_p, \mathbf{x}_v) = \beta c_{vp} - a_{v11}(\theta_1 - x_{v1})^2 - 2a_{v12}(\theta_1 - x_{v1})(\theta_2 - x_{v2}) - a_{v22}(\theta_2 - x_{v2})^2$ , where  $x_v = (x_{v1}, x_{v2})$  is voter  $v$ 's ideal policy preferences and  $a_{v11} > 0$ ,  $a_{v12} > 0$ , and  $a_{v12} < \sqrt{a_{v11}a_{v22}}$  are parameters of the  $v$ 's preference. The term  $c_{vp}$  is voter  $v$ 's assessment of the competence and integrity of party  $p$  that has the power to attempt to enact policy  $\boldsymbol{\theta}_p$ . The parameter  $\beta$  is the weighting of the candidate competence term relative to the weighted Euclidean distance term. Voter  $v$  prefers party  $p$  to party  $q$  if and only if  $U_v(\boldsymbol{\theta}_p, \mathbf{x}_v) > U_v(\boldsymbol{\theta}_q, \mathbf{x}_v)$ .

Now recall the perceived party or candidate competency term  $c_{vp}$  in the citizen's utility. For many societies a citizen's evaluation of a party's leadership dominates the policy and ideological preference of that citizen in voting or supporting a party. Thus, any empirical method for studying political spaces must be able to incorporate party competence in the choice model. The quadratic plus constant model above does just this.

The ideal points of voters are not immutable. The propaganda and advertisements that the parties and candidates disseminate during a political campaign are designed to alter preferences. A candidate wishes to draw voters

towards his position in the political space and away from his opponents as well as providing information to connect the latent political space with the issues that are salient during the campaign. We may not be able to presently model the affects of the media tactics of candidates during a campaign but we can make inferences about where candidates and parties and voter are located in the space as well as providing some insight into the linkage between issues and the latent political space.

## **2 Estimating the Political Space**

Much of this methodology has been delineated elsewhere. We must now offer a methodology for determining political space. In particular, our goal is to articulate a means for determining the relevant issue dimensions of electoral competition. As suggested above, since the pioneering work in the 1960s many spatial models have attempted to account for electoral competition in a multidimensional setting. What is striking, however, is the lack of consensus over (1) how to specify dimensions beyond the simple left-right continuum, and (2) the nature of the second dimension.

The linkage model is an important component of our approach. A linear linkage between policy spaces and the latent political space for quadratic preferences results in an induced quadratic preference for parties located in the political space. This is true for a two-dimensional political space as well as a one-dimensional political space. This important mathematical result makes it possible to determine the political space using existing statistical methods and public opinion data that fit the contours of the spatial theory of electoral competition. The statistical method is called *MAP*, and was developed by Cahoon and Hinich (1976) and modified by Hinich (2004). *MAP* allows a user to learn the nature of the political space and its linkage with critical issues as well as track changes of the space over time. The underlying logic is straight forward: the induced preference model in the political space for each voter is also a quadratic model with a party competence term. Chapter 4 of Enelow and

Hinich (1984) presents the algebraic details of the inheritance of quadratic preferences in the low dimensional space. Assuming that the political space is one-dimensional, voter  $v$ 's induced utility for party's  $p$ 's ideological position  $p$  in the political space is  $U_v(\boldsymbol{\pi}_p, \mathbf{x}_v) = \beta c_{vp} - (\pi_p - y_v)^2$ , where  $y_v$  is  $v$ 's induced ideal position in the policy space. Note that the policy space may have more than one dimension.

The Cahoon-Hinich (1984) methodology uses candidate evaluation scores to estimate a Euclidean representation of political space in a given election. The details of the statistical method is presented in the Appendix to Chapter 9 of Enelow and Hinich (1984) and Hinich (2005). The methodology assumes that each voter's evaluation of a candidate  $2$ ,  $T_{i2}$ , is inversely related to the spatial distance between the voter and candidate and may be written  $T_{i2} = -(|\mathbf{B}_2 - \mathbf{Z}_i|^2)^{1/2} + e_{i2}$ , where  $\mathbf{B}_2$  and  $\mathbf{Z}_i$  are, respectively, candidate  $2$ 's and voter  $i$ 's location in the underlying space and  $e_{i2}$  represent unmeasurable, non-systemic influences on  $T_{i2}$ . The methodology estimates  $\mathbf{B}_2$  by calculating a factor analysis of the covariance matrix from the evaluation scores. To do this, the scores ( $T_{i2}$ ) must first be transformed so they are linear in  $\mathbf{B}_2$  and  $\mathbf{Z}_i$ . This is accomplished in a two-step process. First, one candidate's average scores,  $T_{io}$ , are subtracted from the others. Then the difference between each candidate's average score and  $T_{io}$ 's mean score is subtracted from the first difference. The selection of the candidate whose scores are to be selected is mathematically arbitrary, but interpreting and comparing the maps is easier if one candidate represents the status quo and is the same in each map. The factor analysis of the covariance matrix from these adjusted scores produces, up to an arbitrary rotation, an initial estimate of candidate locations in the underlying space. We then perform two-stage least squares regressions to estimate the remaining parameters of the model including the angle of rotation of the candidate positions. Finally, voter locations are estimated in a separate regression with the dependent variable  $T_{i2} - T_{io}$ , where the right hand side of this equation includes the estimated  $\mathbf{B}_2$ . In evaluating the estimated maps, the proportion of explained

variance from the two regressions should be quite high. As a rough measuring stick, the coefficient of determination,  $R^2$ , in the second of these regressions ought to exceed 0.50, which would indicate the scaling solutions are correct.

### **3 Survey Description and Data**

Following the theoretical model and *MAP* methodology discussed above, we use the data drawn from a recent national telephone survey of adults in the United States to examine American political choice space. This survey was designed by the Institute for Science, Technology and Public Policy at Texas A&M University. The survey was contracted to and executed by the Public Policy Research Institute at Texas A&M University through a Computer-Assisted Telephone Interview (CATI) system. Respondents throughout the United States were selected by a random digit dialing procedure.

The survey included certain questions designed to identify and specify the dimensions of the latent political space and respondents' corresponding positions in the space (more information provided in the next section). The survey questionnaire also included a set of questions on how individual respondents were concerned about a variety of public issues facing the United States, including terrorism, the environment, social security, the war in Iraq/Afghanistan, genetically modified foods, globalization of the economy, energy, global warming and climate change, and the U.S. economy. The orderings of the issue concern questions were randomized for each and every respondent. Additional information on respondents' social demographics, economic conditions and political orientations was also gathered during the interviews. The list of question items designed and used in our survey to measure these variables is attached as Appendix 1.

The survey was conducted in the summer of 2007 with 833 completed interviews, not long before the 2008 presidential primary kicked off. Respondents who did not provide their answers to the question items that we needed to calculate the Cahoon-Hinich political space measures were excluded,

yielding a working dataset for this study that contains 412 interviews (49.46 percent of 833 interviews).<sup>1</sup> Compared to the US Census national figures, our sample with 412 respondents is older in terms of average age (53.04 in our sample versus national average 32.3) and better educated (56.5% with college degree in the sample vs. 26 % national average), and undercounts African Americans (7.28 percent versus 12.3 percent), Hispanics (4.61 percent versus 12.5 percent), and Asian Americans (1.28 percent versus 3.6 percent). 30.85 percent of the respondents identified themselves as Democrats, while 24.85 percent considered themselves Republican. The religious preference of the respondents was Protestant (30.58 percent), followed by Catholic (20.15 percent), Evangelical Christian (9.71 percent), Jewish (1.46 percent), None (15.05 percent), Buddhist (.73 percent), and Muslim (.24 percent). However, compared to the voters' overall profile in 2004 presidential election (US Census Bureau 2006), the respondents in our survey are better matched with the voters' overall profile on most key demographic characteristics such as race, income, education.<sup>2</sup> We believe the closer match between our sample and the overall voters' profile in the 2004 presidential election better serves our research objectives in this study, as the political choice space is primarily determined by those who actually cast their votes in elections rather than by the entire population.

#### **4 Exploring American Political Space**

To identify and construct the latent *Cahoon-Hinich* political space and respondents' corresponding scores, we used respondents' grades on seventeen prominent public figures in American politics. The respondents were asked to

---

<sup>1</sup> Among the 412 respondents in our dataset, 45.15 percent are female (versus 54.85 percent male), and the average age is 53.04. 56.5 percent of respondents hold a college or post-graduate degree, and less than 1 percent had no high school diploma. The ethnicity of the respondents was white non-Hispanic (83.5 percent), followed by African American (7.28 percent), Hispanic (4.61 percent), Asian American (1.28 percent), and Native American (.77 percent). Comparisons of the demographics of the 412 respondents with the 833 full national sample are attached in Appendix 2.

<sup>2</sup> See Voting and Registration in the Election of November 2004 <http://www.census.gov/prod/2006pubs/p20-556.pdf>.

grade the public figures on the policies that each would promote as president.

The original question reads:

I am now going to read you the names of people in the news. For each one, I would like you to imagine this person to be President of the United States and to consider the kinds of general governmental policies this person would promote. Grade this person as President, using letter grades A, B, C, D and F. If you don't have an opinion, just say so.

The seventeen figures were President George W. Bush, Former Vice-President Al Gore, Former President Bill Clinton, Speaker of the House Nancy Pelosi, Vice-President Dick Cheney, Secretary of State Condoleezza Rice, Senator Barack Obama, Senator John Kerry, Former Senator John Edwards, Bill O'Reilly, Senator Edward (Ted) Kennedy, Reverend Jesse Jackson, Rush Limbaugh, Reverend Pat Robertson, General Colin Powell, Senator John McCain, and Senator Hillary Clinton. All the letter grades were converted to numerical grades (A = 5; B = 4; C = 3; D = 2; and F = 1).

Using respondents' numerical grades on these prominent public figures in American politics, we executed the MAP algorithm. Two dimensions emerged from the MAP computations. Figure 1 plots the ideal mean points of the seventeen figures in the two-dimension space.<sup>3</sup>

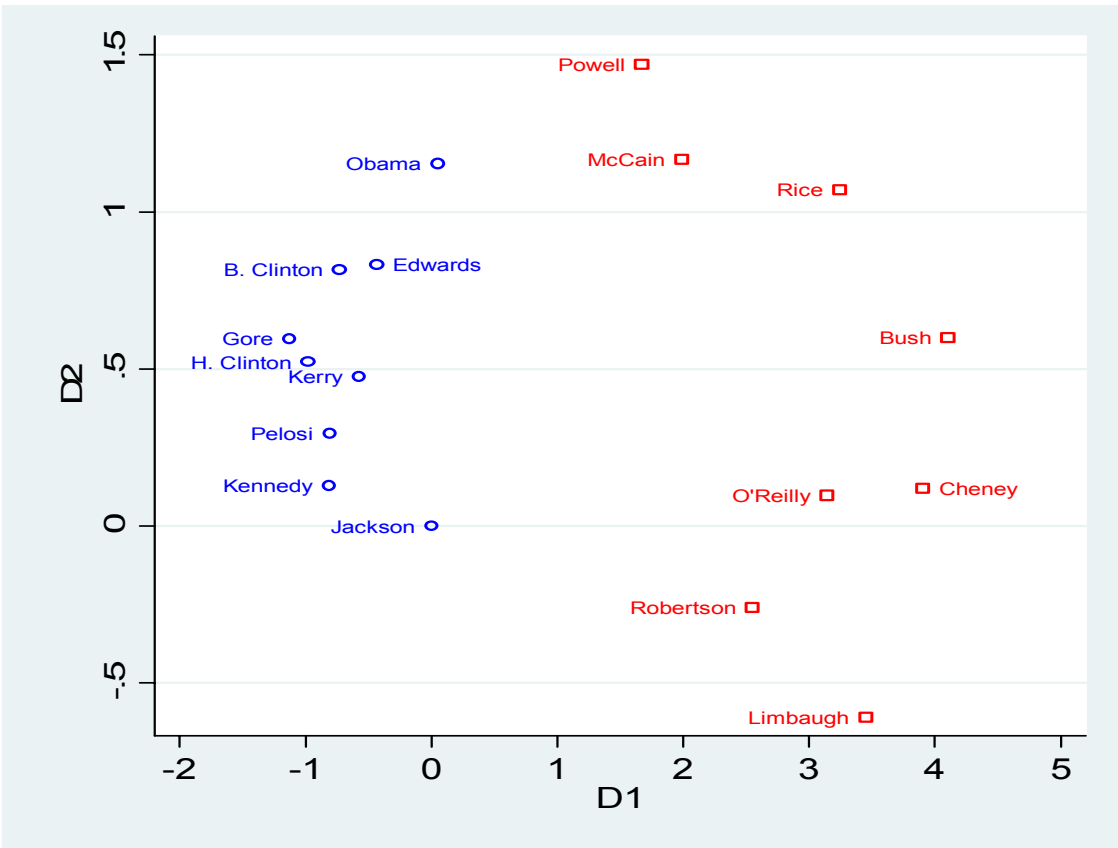
**[Figure 1 about here]**

---

<sup>3</sup> The coordinates were rotated and mirrored to ease visual interpretation.



Figure 1. Two Dimensional Choice Space, Derived from the Respondents' Grades on the Policies that Each of the Seventeen Public Figures Would Promote



The graph in Figure 1 clearly shows that respondents assess these figures along two distinct dimensions – Dimension 1 (D1) along the horizontal axis and Dimension 2 (D2) along the vertical axis. This validates the findings from the work on the 1976 and 1980 elections by Enelow and Hinich (1984) and the work on presidential elections from 1992-2004 by Hinich and Shaw (2006) – both studies uncovered two latent dimensions in American electoral competition.

At first glance, the horizontal dimension appears to represent the traditional left-right cleavage that discriminates amongst the prominent public figures with different positions in terms of their political economy ideologies. The vertical dimension, however, is not obvious. In

the following section, we further discuss the two latent dimensions in American politics and use empirical data to examine the nature of the two distinct dimensions.

## **5 Explaining Dimension 1 with Regression Analysis**

The extant literature on spatial choice and American politics indicates that a strong Downsian, left-right, ideological cleavage exists in American political competition. As shown in Figure 1, the horizontal axis (D1) appears to well capture this cleavage – it clearly separates the public figures based on the left-right ideology – all conservatives/republicans (in red color) are located on the right part of the graph while all democrats/liberals (in blue color) are grouped in the left part of the graph.

To further examine the nature of D1, we run linear regression analysis to see if D1 is truly a left-right ideology dimension. In our regression, D1 is predicted by respondents' concern on public issues, their political orientations and their social demographics. Previous literature indicates that citizen's position along the left-right ideological spectrum is strongly associated with the following factors: (1) issue concerns -- citizens who are concerned more about the terrorism issue tend to have stronger conservative ideology (cite); citizens who are concerned more about the environment tend to have weaker conservative ideology (cite); (2) political orientations -- citizens who are affiliated with the Republican party, assessed themselves as conservatives, or supported Republicans in elected positions are more likely associated with right/conservative ideology (cite); and (3) social demographic factors -- older, less educated, higher income, male citizens with stronger evangelical Christian religion tend to have stronger conservative/right ideology (cite).

Recall that the survey began by asking respondents how concerned they were about certain public issues facing the United States, including terrorism and the environment. The level of issue concern is recorded on a 0-10 scale, with 0 being totally unconcerned and 10 being extremely concerned. Respondent's political orientations are measured by three questions in the survey (see

Appendix 2): (a) political party affiliation -- how respondents identify themselves as Republicans, Independents, or Democrats, ranging from strong Democrat (-3) to strong Republican (+3); (b) self-assessed political ideology – how respondents assess their own political views, ranging from strong liberal (1) to strong conservative (7), and (c) Support for Bush – whether they approved (coded as 1) or disapproved (coded as 0) of the way George W. Bush is handling his job as President. Social demographic information is also gathered from the survey questions, including respondent’s age, education (college degree = 1; no college degree =0), gender (female =1; male =0), evangelical Christian (yes = 1; no = 0), and annual household income classifications (total 11 scales ranging from 1= less than \$10,000, to 11 = more than \$100,000).

Our regression of D1 on the *Issue Concerns*, *Political Orientations* and *Social Demographics* yielded the following results.

**Table 1: Model 1: Determinants of Policy Space Horizontal Dimension (D1)**

	Coefficient	P-Value
<b>(Constant)</b>	-0.822* (.450)	0.069
<b>Issue Concerns</b>		
<i>The Environment</i>	-0.052* (0.030)	0.085
<i>Terrorism</i>	0.071*** (0.025)	0.005
<b>Political Orientations</b>		
<i>Political Party: Democrat- Republican</i>	0.155*** (0.044)	0.000
<i>Self-Assessed Ideology: Liberal-Conservative</i>	0.101** (0.047)	0.033
<i>Support President Bush</i>	0.996*** (0.171)	0.000
<b>Social Demographics</b>		
<i>College Educated</i>	0.076 (0.123)	0.539
<i>Evangelical Christian</i>	0.402** (0.196)	0.041
<i>Gender Female</i>	0.009 (0.122)	0.940
<i>Household Income</i>	-0.019 (0.020)	0.360
<i>Age</i>	0.009*	0.050

	(0.004)
$R^2$	0.5235
$R^2_{ADJ}$	0.5080
$F$	33.84***
$N$	319

\*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ . The cell entries in the left column are regression coefficients; Standard errors are reported in parentheses. The cell entries in the right column are the coefficient p-values. The validity of the regression is assessed using residual plots. There are no multicollinearity issues (all VIFs < 3)

The results of the regression show strong evidence that D1 is fundamentally the traditional left-right, political economy dimension. First, the two *Issue Concerns* are shown to be significantly related with D1. At fixed levels of the other predictors, higher concern about terrorism issue is related with a higher D1 score (i.e., stronger conservative ideology). Higher concern about the environment is related with a lower D1 score (i.e., stronger liberal ideology). Second, D1 is strongly correlated with *Political Orientations*. The directions of the relationships are as expected. At fixed levels of the other predictors, as an individual becomes more Republican or conservative, their D1 value increases. Additionally, those supporting President Bush have a higher D1 value than others. Thirds, under *Social Demographics*, education level, gender and household income are not associated with conservative ideology, but both age and being an Evangelical Christian are statistically related to a higher D1 score, and the directions are expected.

## 6 Possible Explanations to the Nature of Dimension 2

Both the visual examination of the locations of these political figures along D1 and our regression analysis indicate that that D1 is primarily the traditional left-right ideology dimension, but the nature of the vertical dimension (D2) is less obvious and harder to interpret.

Whereas some conservatives such as Rush Limbaugh, Pat Robertson, Bill O'Reilly and Dick Cheney scored low on D2, several well-known liberals such as Jesse Jackson, Ted Kennedy and Nancy Pelosi also scored on the low end of D2. On the upper end of D2, while Republicans Colin Powell, John McCain and Condi Rice gained high scores, Democrats Barak Obama, John Edwards

and Bill Clinton also scored high on D2. Similarly, in the middle range of D2, political figures with moderate scores also came from both liberal and conservative camps. This striking feature of mixed liberal and conservative figures along the vertical dimension suggests that D2 is a unique dimension that is independent from the traditional left-right ideology. But what is the nature of the D2?

Previous works on spatial choice provided some clues about the possible makeup of D2, but the findings/speculations were inconsistent. First, some studies suggest that while D1 is left-right dimension, D2 is “everything else” (cite). This argument reveals little information about the nature of D2. Second, some studies argue that the second dimension seems to be a foreign affair/defense policy dimension (Brady 1989; Travis 1995), but this argument does not seem to justify why people’s choices are affected by this foreign affair/defense criterion. Third, Enelow and Hinich (1984) suggest that D2 may be related to various social issues (such as women’s rights, abortion, etc.) at different times, and this argument received certain support from other studies (Steeper 1995; Aldrich, 1995). However, the MAP results shown in Figure 1 do not seem to conform to these arguments/explanations. For instance, if the nature of D2 is about foreign affairs and national defense, why would Barack Obama load closely to John McCain, and why would Ted Kennedy load closely to Dick Cheney? Similarly, if D2 is about social issues, why would voters not discriminate between Hilary Clinton and George W. Bush? Clearly, the nature of D2 lurking in the background of voters’ assessment of political figures is neither about foreign and defense issues nor about social issues.

Hinich, Shaw and Huang (2010) apply MAP to feeling thermometer scores from several NES. They argue that D2 was probably about “reform,” and the nature of D2 is “insurgent vs. establishment”.

We think this ‘insurgent vs. establishment’ argument is perhaps by far the most plausible explanation. If we look at the middle and upper portions of Figure 1, we see that “reformers/insurgents” such as Obama, Powell, and

McCain indeed load closely against the “established interests” (such as Hilary Clinton and G.W. Bush). However, this explanation, while tapping into the nature of D2, still does not seem to reveal the whole story about D2, as it cannot explain why Cheney, O’Reilly, Kennedy and Pelosi are clustered together in the middle-lower section of D2, and why Limbaugh, Robertson and Jackson, who are also usually viewed by the general public as “insurgents,” are located in the lowest portion along the vertical dimension.

A closer examination of candidates’ locations along D2 leads us to a more generalized argument/proposition: D2 represents a reform prospect dimension, with those perceived by voters as having positive/progressive reform prospect on the top, established interests/business-as-usual/little reform/status quo in the middle, and divisive, negative reform prospect at the bottom. We further discuss this proposition and use empirical data to test our argument in the next section.

## **7 Further Discussion and Preliminary Test on the Nature of D2**

One consensus among spatial choice scholars is the existence and significance of the left-right ideology dimension in American political choice. Numerous studies demonstrate that voters gauge and compare the distances between their ideal position and candidates’ positions along this traditional political economy dimension. However, some scholars find that the left-right ideology is not the only consideration when people evaluate candidates and make their choices. A number of previous studies and the graph in Figure 1 clearly show that a distinct, second, dimension exists in American political competition. While there are various speculations and debates about the nature of the second dimension, in this paper, we argue that the vertical axis represents a ‘reform prospect dimension’ – along this dimension, voters differentiate between and amongst political figures, with those showing greater positive reform-prospect (top) squaring off those with established interests (middle) and degenerating reform prospect (bottom).

Voters care about and assess candidate's reform-ability/prospect. While every candidate promises to bring changes to the current politics and policies, two major differences among the candidates are perhaps seen by the voters with regard to their reform-ability/prospect. The first difference is what Hinich and Shaw called "insurgents vs. establishments" -- the difference between those who are perceived to be able to make significant or more changes to the existing politics and policies and those who would make less or little changes. The second difference is between those who are perceived to be able to make progressive/positive changes and those who would make divisive/negative changes.

Now let's take a closer look at how the 17 political figures are located along D2 in Figure 1. Note there are approximately three groups in terms of their relative locations along D2: the upper group represented by Collin Powell, Barak Obama and John McCain; the middle group by Hilary Clinton, Al Gore, John Kerry, and George W. Bush, and the lower group by Jesse Jackson, Pat Roberson and Rush Limbaugh. The figures in both the upper and lower groups are typically viewed as "insurgents," who would be more likely to bring large changes to the political systems and the policy outcomes if in power, while the figures in the middle-group are typically perceived as those having strong ties to the established political systems and thereby having little interests in making significant changes to the existing politics and policies. Furthermore, voters perhaps also discriminate between and amongst the insurgents—some insurgents (Powell, Obama, and McCain) could be perceived as progressives (who would bring positive reforms) and placed higher on the vertical dimension, while others (Limbaugh, Robertson, and Jackson) could be viewed as controversial radicals who would bring negative changes.

The locations of the 17 figures along the vertical D2 seems to well represent this "reform-prospect" dimension: on the top are the positive and progressive reformers, on the bottom are the controversial figures with extreme views of change, and the status quo proponents who believe in minimal change are in

between. Moreover, this reform prospect dimension also seems to represent the variations among the more or less established interests located within the middle group—for example, Condoleezza Rice, John Edwards and Bill Clinton load higher in this group, suggesting they may be viewed as having more positive reform prospects, compared to Nancy Pelosi, Ted Kennedy and Dick Cheney, who are often viewed as having more ‘radical’ reform agendas. To test if the nature of the vertical dimension is truly about reform-prospect, we conduct further empirical analysis to identify what factors determine the relative placement of these figures placed by voters along this dimension.

We believe that there are at least three interlinked components in voter’s mind when evaluating candidate’s reform-prospect: cynicism to the established political order, moral demand for political candidates, and dissatisfaction toward real-politicking.

Hinich and Shaw (2006) noticed that cynicism toward the government has been growing in the United States since the 1960s. Associated with the cynicism is the popular frustration toward existing political order and entrenched political interests. As Hinich and Shaw found in their study on recent presidential elections, “candidates or persons seen as outside or ‘above’ the established order are imbued with a ‘reform’ aura that can be quite powerful,” and “candidates articulating this cynicism tap into this latent (vertical) ideology and crosscut the traditional left-right order.” Americans want more or less reforms to change the existing politics and policies, but they do not want radical and destructive changes based on candidate’s self-interest. Voters cannot ensure whether a political leader will conduct constructive reforms, but they may infer the prospects from their assessments to candidates’ morality and integrity. While every candidate promises to make more or less changes during campaigns, it is reasonable to believe that voters would prefer the candidate with higher ethic standards to implement his/her reform agendas; it is also reasonable to believe that voters would prefer status



quo candidates to those who would make corrupt decisions and policies and thereby bringing in destructive outcomes to the political systems.

Another component of the reform prospect dimension is perhaps the popular dissatisfaction toward the paralyzing divisions and realpoliticking commonly seen in American politics, particularly the polarized partisan approach to politics and policy making. While voters understand the existence and importance of the left-right cleavage in American politics and assess candidates along this dimension, they are often frustrated with the traditional, realpoliticking based, left-right battles, which frequently lead to either partisan outcomes or policy gridlocks. Thus, candidates perceived as unbranded mavericks or painting themselves as unifying forces (rather than divisive figures) that go beyond the left-right partisan approach sometimes can strongly appeal to this anti-realpoliticking thinking.

To further examine our argument about the nature of the D2, we employ the same survey data and linear regression analysis to conduct an empirical test. We regress respondents' scores along the D2 with their concerns about terrorism and the environment, their political orientations, their evaluation of candidate's honesty and integrity, and their partisanship. Social demographics are also added to the regression model.

If the vertical axis is a dimension crosscutting the traditional left-right cleavage and associated with reform prospect, it is expected to see the following:

The two issue concerns (terrorism and the environment), typically associated with left-right political economy ideology, should not be significant in predicting D2

Respondents' political orientations should not be statistically significant in predicting D2

Respondents' evaluation of candidate's honesty and integrity should be positively associated with D2

Respondent's partisanship should be a negative factor in explaining D2. In other words, the more partisan an individual is, the lower he/she would score on D2.

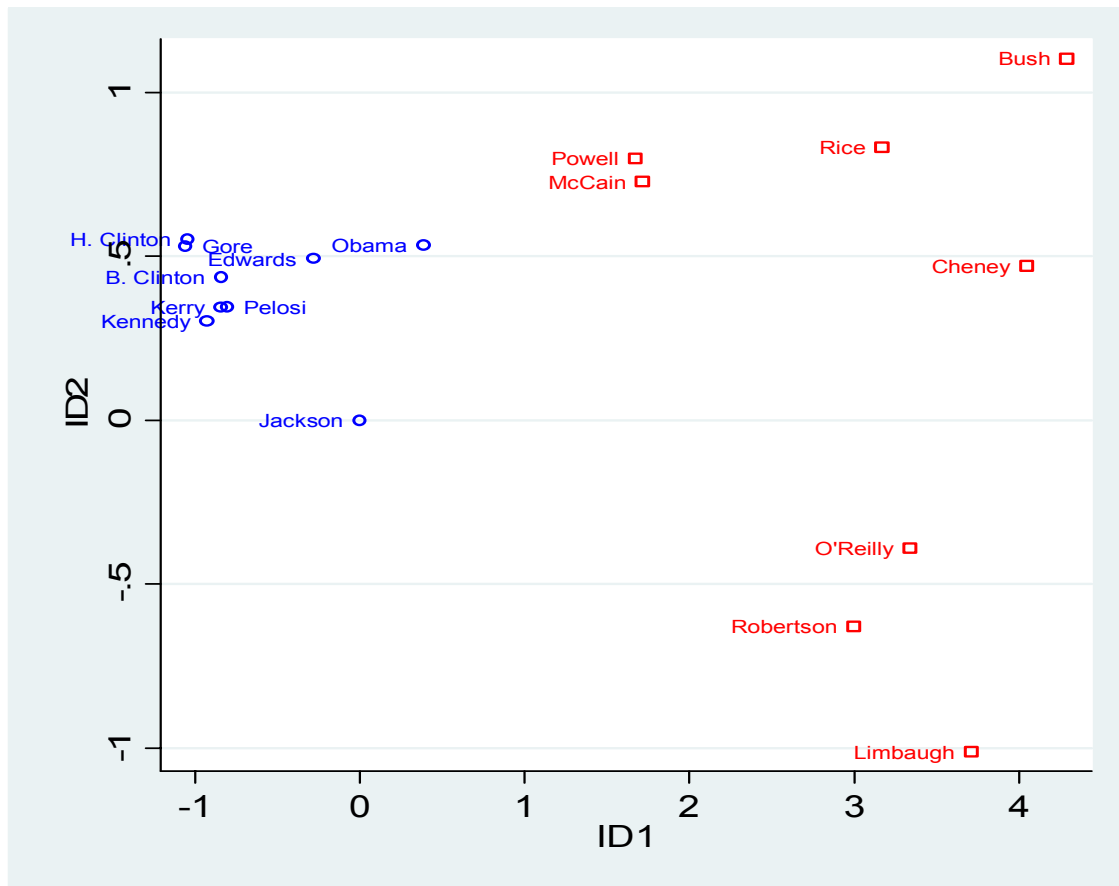
The two issue concern variables, respondents' political orientations and social demographics are the same measures that we used in Regression Model 1 (see Table 1). In the survey questionnaire, we asked respondents to identify which category best describes his/her political views, ranging from 1= strongly liberal, 2= liberal, 3=slightly liberal, 4=middle of the road, 5=slightly conservative, 6=conservative, and 7=strongly conservative. Respondent's partisanship is measured by the square of the scalar difference between respondent's actual category (1-7) to the sample mean of the political view ideology variable, approximately 4.3. This is close to the Middle of the Road (=4). A T-test on political ideology strongly rejects the hypothesis that the population mean does not exceed Middle of the Road (=4). So we use the sample mean to center in the calculation of partisanship instead of the Middle of the Road (=4) value. As the squared difference increases, the individual veers further from the average political ideology of the population of U.S. Voters.

In the survey, respondents were also asked to grade each of the seventeen figures for their level of honesty and integrity. However, simply using respondents' grades may be problematic, because their assessments of candidates' honesty and integrity may be well affected by the distance between respondent's and candidates' political ideology positions. In other words, it is highly likely that respondents give higher scores to the candidates who belong to the same party and have similar political ideology. To examine whether the honesty and integrity grades are affected by the left-right ideology factor, we execute the MAP algorithm using those respondents who graded all seventeen figures on honesty and integrity. There were 445 individuals who did so. The MAP algorithm yielded two non-negligible dimensions derived from respondents' grades on the seventeen public figures for their level of honesty and integrity. We plot the ideal mean points of the seventeen figures in Figure

2. As before, the two coordinates in Figure 2 were rotated and mirrored to ease visual interpretation. We call the two dimensions Integrity Dimension 1 (ID1) Integrity Dimension 2 (ID2).

[Figure 2 about here]

Figure 2. Two Dimensional ‘Integrity’ Space, Derived from Respondents’ Grades for the Level of Honesty and Integrity for Each of the Seventeen Public Figures



In Figure 2, ID1 appears to be the traditional liberal-conservative dimension. A linear regression of ID1 on the *Political Orientations* variables shows that they are strongly related ( $R^2_{ADJ} = 0.526$ ). This strong correlation indicates that ID1 is fundamentally the traditional left-right dimension, suggesting that “political

economy ideology” is indeed a strong factor in voters’ assessments of candidates’ honesty and integrity. On the other hand, the regression of the second latent dimension in the integrity space, ID2, on the same *Political Orientations* variables shows a very weak relation ( $R^2_{ADJ} = 0.018$ ), suggesting that ID2 is probably a “true” integrity dimension, independent of the left-right political ideology factor. Thus, in the regression model to examine the nature of D2, we use ID2 as the measure of integrity.

Regression of D2 on the *Issue Concerns*, *Political Orientations*, *Partisanship*, *Integrity*, and *Social Demographics* predictors yielded the following results in Table 2.

**Table 2: Model 2: Determinants of Policy Space Vertical Dimension (D2)**

	Coefficient	P-Value
<b>(Constant)</b>	0.514 (0.492)	0.297
<b>Issue Concerns</b>		
<i>Environment</i>	-0.016 (0.033)	0.625
<i>Terrorism</i>	0.014 (0.027)	0.615
<b>Political Orientations</b>		
<i>Political Party: Democrat-Republican</i>	-0.011 (0.048)	0.823
<i>Self-Assesed Ideology: Liberal-Conservative</i>	-0.054 (0.053)	0.312
<i>Support President Bush</i>	-0.037 (0.200)	0.852
<b>Partisanship</b>		
(Distance to the Centered Non-Partisan Position) <sup>2</sup>	-0.047** (0.021)	0.029
<b>Integrity</b>		
<i>ID2</i>	0.306*** (0.053)	0.000
<b>Social Demographics</b>		
<i>College Educated</i>	0.278** (0.133)	0.038
<i>Evangelical Christian</i>	-0.399* (0.212)	0.060
<i>Gender Female</i>	0.074 (0.135)	0.585
<i>Household Income</i>	0.009 (0.022)	0.697
<i>Age</i>	0.001	0.788

	(0.005)
$R^2$	0.1894
$R^2_{ADJ}$	0.1536
$F$	5.29***
$N$	285

\* p < 0.1; \*\* p < 0.05; \*\*\* p < 0.01. The cell entries in the left column are regression coefficients; Standard errors are reported in parentheses. The cell entries in the right column are the coefficient p-values. The validity of the regression is assessed using residual plots. There are no multicollinearity issues (all VIFs < 3)

The validity of Model 2 was assessed using residual plots. Multicollinearity was investigated by using the variance inflation factors (VIFs) of each predictor. Each VIF fell below two, indicating no serious multicollinearity problem among the predictors in explaining D2.

As shown in Table 2, D2 is not influenced by any L-R factors. Specifically, both the issue concerns on terrorism and the environment, which are usually left-right ideology based issues (as shown in Model 1 regression results), are not correlated with D2. Furthermore, as expected, none of the political orientations variables (i.e., party ID, self-assessed liberal-conservative ideology, and support for G.W. Bush) is significant predictor for explaining D2.

More importantly, the results in Table 2 provide strong evidence supportive of our argument that D2 is a “reform prospect” dimension. At fixed values of the other predictors, the hypothesis that *Partisanship* was inversely related with D2 was corroborated by Model 2 – the stronger partisan an individual is, the lower score they get on D2. As for the integrity variable (i.e., measured by the scores along the ID2 in the integrity space), we found that it was significantly associated with D2. This corroborates our hypothesis that *Integrity* is a positive factor in explaining D2. In addition, the *Social Demographic* indicators for college education and being an Evangelical Christian were both significantly related with D2 under Model 2. At fixed levels of the other predictors, college education increased D2 and being an Evangelical Christian decreased D2.

## 8 Conclusion

We have shown that there is a second dimension that is driven by a cleavage among different reform issues ranging from progressive reform to status-quo to

divisive change. There is every reason to believe that the reform issues will reshape American politics during the next hour years. The future is impossible to predict with certainty but the evolution of trhe second latent dimension strongly suggests that the American political class will struggle to retain their power acquired by their control of the fiscal and monetary policy that has evolved during the last thirty years.

#### REFERENCES

- Cahoon, L., and M. J. Hinich, "A Method for Locating Targets Using Range Only," *IEEE Trans. on Information Theory* **IT-22** (2), 217-225, (1976)
- Cahoon, L., M. J. Hinich and P. C. Ordeshook, "A Statistical Multidimensional Scaling Method Based on the Spatial Theory of Voting," *Graphical Representation of Multivariate Data*, P.C.Wang (ed.), Academic Press, New York, 243-278, (1978).
- Enelow, J. and M. J. Hinich, *The Spatial Theory of Voting: An Introduction*, Cambridge University Press, January (1984)
- Enelow, J. and M. J. Hinich, *Advances in the Spatial Theory of Voting*, (eds.), Chapter 7, Cambridge University Press (1990)
- Hinich, M. J., "A New Statistical Multidimensional Unfolding Method," *Communication in Statistics* **34**, 2299-2310, (2005)
- Hinich, M. J. and W. Pollard, "A New Approach to the Spatial Theory of Electoral Competition," *American Journal of Political Science*, 25(2), 323-341, (1981)
- Hinich, M. J. , D. R. Shaw and T. Huang, "Insiders, Outsiders, and Voters in the 2008 U. S. Presidential Election" *Presidential Studies Quarterly*, June 2010
- Munger, M. C. and M. J. Hinich, *Ideology and the Theory of Political Choice*, University of Michigan Press, (1994)
- Munger, M. C. and M. J. Hinich, *Analytical Politics* Cambridge University Press, (1997).
- Munger, M. C. and M. J. Hinich, *Empirical Studies in Comparative Politics*, Kluwer Academic Publishers, (1999)

## Appendix 1: Survey Question and Variable Label

### Issue Concerns

VARIABLE LABEL	QUESTION
<i>Social Security</i> <i>War in Iraq/Afghanistan</i> <i>Energy</i> <i>U.S. Economy</i> <i>Environment</i> <i>Terrorism</i>	<p>On a scale from 0 to 10, with 0 indicating completely unconcerned and 10 indicating extremely concerned, rate these issues on how concerned you are personally about each.</p> <p><b>[Issue ordering on the survey should change for each respondent]</b>  <b>[Repeat 0-10 scale if necessary with each issue.]</b></p> <p>___ Social Security            ___ War in Iraq/Afghanistan            ___ Genetically Modified Foods            ___ Globalization of the Economy            ___ Energy            ___ Global Warming and Climate Change            ___ The US Economy            ___ The Environment            ___ Terrorism            ___ Moral Values            ___ Are there any other issues you are particularly worried about?            [verbatim response]_____</p>

### Questions used to compute Cahoon-Hinich political space measures

VARIABLE LABEL	QUESTION
<i>Dimension 1</i>  <i>Dimension 2</i>	<p>I am now going to read you the names of people in the news. For each one, I would like you to imagine this person to be President of the United States and to consider the kinds of general governmental policies this person would promote. Grade this person as President, using letter grades A, B, C, D and F. If you don't have an opinion, just say so.</p> <p><b>[Names should be presented in random order]</b></p> <p>___ President George W. Bush            ___ Former Vice-President Al Gore            ___ Former President Bill Clinton            ___ Speaker of the House Nancy Pelosi            ___ Vice-President Dick Cheney            ___ Secretary of State Condoleezza Rice            ___ Senator Barack Obama            ___ Senator John Kerry            ___ Senator John Edwards            ___ Bill O'Reilly            ___ Senator Edward (Ted) Kennedy            ___ Reverend Jesse Jackson            ___ Rush Limbaugh</p>

	<input type="checkbox"/> Reverend Pat Robertson <input type="checkbox"/> General Colin Powell <input type="checkbox"/> Senator John McCain <input type="checkbox"/> Senator Hillary Clinton  <i>Letter grades were converted to numerical grades:  A = 5; B = 4; C = 3; D = 2; and F = 1</i>
--	---

Social Demographics and Economic Status Questions

VARIABLE LABEL	QUESTION
<i>Age</i>	How old are you?  [Record actual age]_____
<i>Gender Female</i>	As part of the survey, I am required to ask: are you male or female? 1. Male 2. Female  <i>Gender Female was a dummy variable with 1 representing for female and 0 for male</i>
<i>College Educated</i>	What is the highest level of education you have completed?  1 Elementary or some high school 2 High school graduate/GED 3 Trade or vocational certification 4 Some college/Associates degree 5 College graduate, or 6 Post-grad degree  <i>College Educated was a dummy variable based on education level:  1= college education and/or post-grad degree  0= otherwise</i>
<i>Household Income</i>	What was the estimated annual income for your household for 2006?  1 Less than \$10,000 2 10 to 20 3 21 to 30 or, 4 31 to \$40,000 5 41 to \$50,000 6 51 to 60 7 61 to 70 8 71 to 80 9 81 to 90 10 91 to 100 or 11 More than \$100,000



<i>Evangelical Christian</i>	<p>What is your religious preference?</p> <p>Protestant Catholic Evangelical Christian Jewish Muslim Buddhist Other NONE</p> <p><i>Evangelical Christian was a dummy variable, 1 for Evangelical Christian self-identification by Respondent, 0 otherwise</i> (if this question not answered dummy variable was censored)</p>
------------------------------	---

Political Orientations

VARIABLE LABEL	QUESTION
<i>Political Party (Democrat-Republican)</i>	Generally speaking, do you think of yourself as a Democrat, Republican, or Independent? 1. Democrat 2. Republican 3. Independent
	Do you consider yourself a strong or weak (Democrat/Republican)? 1. Strong 2. Weak
	As an Independent, do you generally lean more toward Democrat or Republican candidates? 1. Lean Democrat 2. Lean Republican 3. Neither
<i>Political Party was a scalar variable generated from these three questions running from -3 (Strong Democrat) to +3 (Strong Republican)</i>	
<i>Self-Assessed Ideology (Liberal-Conservative)</i>	Which of the following categories best describes your political views? Would you say that you are: 1 Strongly liberal 2 Liberal 3 Slightly liberal 4 Middle of the road 5 Slightly conservative 6 Conservative, or 7 Strongly conservative 8 OTHER (SPECIFY)
<i>Outcome 8 was censored</i>	
<i>Support President Bush</i>	Do you approve or disapprove of the way George W. Bush is handling his job as President? 1. Approve

	<p>2. Disapprove</p> <p><i>Support President Bush was a dummy variable taking 1 for Approve and 0 for Disapprove</i></p>
--	--

Partisanship

VARIABLE LABEL	QUESTION
<i>Partisanship</i>	<p>Which of the following categories best describes your political views? Would you say that you are:</p> <p>1 Strongly liberal  2 Liberal  3 Slightly liberal  4 Middle of the road  5 Slightly conservative  6 Conservative, or  7 Strongly conservative  8 OTHER (SPECIFY)</p> <p><i>Outcome 8 was censored</i></p> <p><i>Partisanship was measured by the square of the scalar difference between respondent's position (1-7) to the Middle of the Road(4). For instances, if respondent describes his/her as Liberal (=2), then the partisanship score is <math>(2-4)^2 = 4</math>; if respondent's position is Strongly Conservative (=7), then his/her partisanship is <math>(7-4)^2=9</math>.</i></p>

Integrity

VARIABLE LABEL	QUESTION
<i>Integrity 1 (ID1)</i> <i>Integrity 2 (ID2)</i>	<p>Now, when you think about the previous list of people, how would you grade each one for their level of honesty and integrity</p> <p><b>[Names should be presented in random order]</b></p> <p>____ President George W. Bush  ____ Former Vice-President Al Gore  ____ Former President Bill Clinton  ____ Speaker of the House Nancy Pelosi  ____ Vice-President Dick Cheney  ____ Secretary of State Condoleezza Rice  ____ Senator Barack Obama  ____ Senator John Kerry  ____ Former Senator John Edwards  ____ Bill O'Reilly  ____ Senator Edward (Ted) Kennedy  ____ Reverend Jesse Jackson  ____ Rush Limbaugh</p>

	<p>_____ Reverend Pat Robertson _____ General Colin Powell _____ Senator John McCain _____ Senator Hillary Clinton</p>
--	--

## Appendix 2: Comparison of the Key Demographics of the Sub-sample with the Full National Sample

### Gender

	Subsample 412		Full Sample 833	
<i>Female</i>	186	45.15	438	52.58
<i>Male</i>	226	54.85	388	46.58
<i>Censored</i>	--		7	0.84
	--			

### Education

	Subsample 412		Full Sample 833	
<i>Elementary to Some High School</i>	4	0.97	19	2.28
<i>High School</i>	57	13.83	136	16.33
<i>Trade or Vocational</i>	10	2.43	22	2.64
<i>Some College</i>	107	25.97	219	26.29
<i>College</i>	145	35.19	262	31.45
<i>Post-College</i>	88	21.36	168	20.17
<i>Censored</i>	1	0.24	7	0.84

### Race

	Subsample 412		Full Sample 833	
<i>White</i>	344	83.50	676	81.15
<i>African American</i>	30	7.28	52	6.24
<i>Hispanic</i>	19	4.61	48	5.76
<i>Asian American</i>	5	1.21	13	1.56
<i>Native American</i>	3	0.72	12	1.44
<i>Native Hawaiian Pacific Islander</i>	1	0.24	2	0.24
<i>Other/Censored</i>	10	2.43	30	3.60

### Political Party

	Subsample 412	Full Sample 833
<i>Strong Democrat</i>	95 23.06	169 20.29
<i>Democrat</i>	4 0.97	10 1.2
<i>Weak Democrat</i>	94 22.82	187 22.45
<i>Independent</i>	36 8.74	108 12.97
<i>Weak Republican</i>	90 21.84	168 20.17
<i>Republican</i>	4 0.97	11 1.32
<i>Strong Republican</i>	76 18.45	129 15.49
<i>Censored</i>	13 3.16	51 6.12

### **Ideology: Liberal-Conservative**

	Subsample 412	Full Sample 833
<i>Strongly liberal</i>	27 6.55	48 5.76
<i>Liberal</i>	65 15.78	128 15.37
<i>Slightly liberal</i>	39 9.47	74 8.88
<i>Middle of the road</i>	78 18.93	196 23.53
<i>Slightly conservative</i>	60 14.56	122 14.65
<i>Conservative</i>	89 21.60	139 16.69
<i>Strongly conservative</i>	46 11.17	86 10.32
<i>Other/Censored</i>	8 1.94	40 4.8

### **Religious Preference**

	Subsample 412	Full Sample 833
<i>Protestant</i>	126 30.58	235 28.21
<i>Catholic</i>	83 20.15	167 20.05
<i>Evangelical Christian</i>	40 9.71	71 8.52
<i>Jewish</i>	6 1.46	13 1.56
<i>Muslim</i>	1	2

		0.24	0.24
<i>Buddhist</i>	3	0.73	7
		15.05	120
<i>None</i>	62	19.66	182
		2.43	36
<i>Other</i>	81		4.32
<i>Censored</i>	10		

### Annual Household Income

	Subsample 412		Full Sample 833	
<i>less than \$10,000</i>	5	1.21	14	1.68
<i>10 to \$20,000</i>	13	3.14	47	5.64
<i>21 to \$30,000</i>	30	7.28	56	6.72
<i>31 to \$40,000</i>	29	7.04	65	7.8
<i>41 to \$50,000</i>	37	8.98	75	9
<i>51 to \$60,000</i>	40	9.71	70	8.4
<i>61 to \$70,000</i>	19	4.61	40	4.8
<i>71 to \$80,000</i>	20	4.85	45	5.4
<i>81 to \$90,000</i>	27	6.55	43	5.16
<i>91 to \$100,000</i>	28	6.80	49	5.88
<i>more than \$100,000</i>	97	23.54	157	18.85
<i>Censored</i>	67	16.26	172	20.65

### Age

	Subsample 412		Full Sample 833	
<i>18-29</i>	17	4.13	51	6.12
<i>30-39</i>	58	14.08	114	13.69
<i>40-49</i>	89	21.60	171	20.53
<i>50-59</i>	113	27.43	217	26.05

<i>60-69</i>	65	15.78	134	16.09
<i>70-79</i>	36	8.74	72	8.64
<i>80-100</i>	23	5.58	49	5.88
<i>Censored</i>	11	2.67	25	3