The Spatial and Temporal Distribution of Capital and Labor in an Election Campaign

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Abstract: We examine the geography of volunteer and donor participation, by day, over the course of an election campaign, observing variably sized cross-sectional units of aggregation. From a geographic standpoint, voluntarism and campaign contributing are gross complements rather than substitutes. Even so, important differences exist as volunteers emerge from a broader variety of places than donors. Volunteers are most readily activated in locations with younger populations, in politically competitive areas, and in places with higher median income, although not always the very highest income locales. Donors, on the other hand, emerge in the most highly affluent settings of large cities, often in proximity to significant minority populations. Scale effects are important to both the size and significance of estimates. Investigators expecting to see pronounced effects on participation at broad scales of aggregation will often be disappointed, though such effects will commonly be present at a more localized scale.

Do volunteers emerge in locations where contributors do not? Can a political campaign harvest campaign donations in the same places where they find a robust volunteer labor supply? The answers to these questions bear on fundamental differences in participatory behavior among populations in response to the stimulus of elections. Political participants and non-participants do not simply have a psychology, but also a geography, rendering certain settings more conducive to mobilization, and specific forms of participation, than others. Spatial variation in participatory behavior tells us something about the kinds of social settings that promote or inhibit effective involvement.

Our contention is that the supply of campaign labor and capital are clustered, because wealth and the allied resources that promote more demanding forms of participation are greatly concentrated (Verba, Schlozman and Brady 1995). The implication of this concentration is that the degree of complementarity between volunteer and contributor input to a campaign or social movement exhibits a geographic dimension, not merely an individual, aspatial one.

Locations, or places, matter because individual decisions to participate have a social component, and those social influences are constrained by distance to the spaces where individuals live their lives. The participation habits of citizens are shaped by the people with whom they interact on a regular basis (Olsen 1976; Lake and Huckfeldt 1998; Huckfeldt and Sprague 1995; Klofstad 2007). Because of the social anchorage of these forms of political participation, there exist spaces of engagement and spaces of disengagement.

From the political campaign's standpoint, learning *where* activism is more or less likely to occur is of incalculable importance. Campaigns must pay attention to electoral terrain because prospective voters – the targets of campaign outreach -- almost never reside in a single, compact location. Critical elements of campaign strategy are bounded and dictated by the location of loyalists, opponents, and the non-aligned (Key 1964, 463-466).

To reach voters, campaigns first need a healthy supply of donors, volunteers, or both. But just as targeted voters are not all found in the same places, neither are volunteers and donors – crucial early targets of campaign recruitment. Because campaigns must hunt for these resources and solicit their support, knowing something about the pool from which volunteers and donors can be recruited is an important first step (Wilson and Musick 1999). Once initial pockets of assistance are found, chances are good that through the process of network exchange, this asset base can be broadened (Wilson 2000; Cho and Gimpel 2007). Volunteers and donors are typically asked to enlist the support of family members, friends, and business associates; people within their personal spheres of contact (Caroline 2003, 26).

Most larger-scale campaigns establish local infrastructure and outreach operations in more than just a single location (Shea and Burton 2006). Campaign volunteers serve the valuable purpose of staffing satellite offices as well as campaign headquarters. Their support, given freely and without obligation, can save the campaign tens-of-thousands of dollars over the course of a few months. These valuable resources do not spring out of the ground at the wave of a wand.

Campaigns are obliged to enlist the benevolence of these participants and doing so involves the geographic questions of how these resources are distributed across space and time, and what ventures might tap them (Verba, Schlozman and Brady 2000; 1995).

Studies of the geographic and temporal variation in the demanding forms of political participation we address here have rarely been carried out by political scientists, whose chief concern has been to gauge the effects of campaign activity on public opinion and candidate support. Furthermore, an analysis of where contributors and volunteers originate over the course of an election cycle has not surfaced in previous studies because the appropriate kind of information has usually been inaccessible.

We employ a unique data set collected during the 2006 election cycle on the neighborhood origins of contributors and volunteers, drawing upon *daily observations* from January 1 through November 6 -- a total of 311 daily observations. An additional appealing dimension we add to this study is that we examine voluntarism and contributions at a range of spatial scales. Commonly, campaign effects research is carried out at only a single scale of aggregation, using media market areas, or entire states. But if local settings do matter to the kind of interaction that promotes political recruitment and participation, the examination of these questions at only a single broad-scale of aggregation is ill-considered. Because we rearrange our observations at varying spatial scales, we are able to evaluate whether the ecological circumstances that are productive of voluntary and contributory activity are more local or global. From a methodological standpoint,

statistical results are known to be sensitive to spatial scale at which data have been collected – few relationships are truly scale independent (Sheppard and McMaster 2004; Fotheringham, Brunsdon and Charlton 2002; Openshaw and Taylor 1979). Since our design allows us to compare effects across scales of observation, we will be able to address the question of the scale variance of statistical effects.

The resources and political commitments of local populations, in combination with the temporal flow of political events, enhance or contract the supply of volunteer labor and financial capital available to a major campaign. We will determine whether there is spatial convergence or divergence between the settings that are productive of campaign volunteers, and those that supply financial contributors. Settings in which these resources are spatially disjoint appear to complicate the task of campaigning, far more so than would be the case if there was greater intersection between the two asset bases.

Backgrounds and Motivations of Contributors and Volunteers

Verba, Schlozman and Brady (2000) suggest that there are three fundamental types of participatory acts: those that take time (e.g., volunteering); those that require money (e.g., contributing); and those that require little to none of either (voting) (p. 254). Each type requires a different kind of background, drawing upon a characteristic mixture of resources and motives. People make choices about whether to volunteer time or contribute money based principally on the opportunity cost of time, and their level of affluence.

Previous research has provided considerable insight into the elite backgrounds of political contributors. Most surveys show that the number of campaign donors is an exceedingly small percentage of the total population, perhaps 8-10 percent[1], but that they are far more affluent, older and male than the average adult citizen (Francia, Herrnson, Green, Powell and Wilcox 2003). Their motives for giving vary, but a large share of their donation activity appears to be anchored in solidary and purposive motives (Clark and Wilson 1961; Wilson 1973). From a purposive standpoint, givers donate because they want to see their party or candidate win, often because they have favored policy objectives in mind. From a solidary standpoint, they contribute because they are socially embedded, and seek the approval of others.

Contributors to political campaigns often desire to be seen as prestigious and influential players, and rarely contribute because they are rent seeking or investing – the principal explanation for why PACs and businesses contribute (Grossman and Helpman 1994). Individuals give not simply because the act of giving is satisfying to them, but because they want to signal to others that they are of high status (Verba, Schlozman and Brady 2000; Becker 1974; Coleman 1990). For a variety of reasons, then, contributing to campaigns possesses the characteristics of a consumption good, directly satisfying the donor's desires; rather than the characteristics of an investment (Ansolabehere, deFiguereido and Snyder 2003).

[1] The 2004 *American National Election Study* reports that 9.6 percent of respondents contributed to a political party or candidate that year, up from 5.7 percent in 2000. These figures are likely exaggerated resulting from typical over-reports of participation in survey research.

Recently, several papers have explored the geographic positioning of individual contributors (Gimpel, Lee and Kaminski 2006; Cho and Gimpel 2007; Cho 2003). We have learned from this body of work that a major campaign's most significant contributors are concentrated in major metropolitan areas, in affluent neighborhoods, and are commonly part of professional, ethnic or friendship networks, that facilitate the extraction of larger donations than would be forthcoming from individuals solicited in isolation (Dawes and Thaler 1998; Andreoni and Scholz 1998; Carman 2003). Contributors do give independently of these peer networks, but the larger contributions to campaigns generally issue forth in response to collaborative recruitment.

Volunteers are those people who give of their time to assist the organization, for no financial gain, and without obligation (Janoski and Wilson 1995; Wilson 2000; Verba, Schlozman and Brady 1995). Like donors, political volunteers are also a minuscule fraction of the population; just 3.4 percent of respondents reported working for a campaign or political party in the 2004 *American National Election Study,* up from 2.4 percent in 2000. A 2004 survey of Texas adults, especially germane to our research here, indicated that about 7 percent had volunteered to work in a campaign over the previous year. Summary tabulations show that these Texas volunteers were more likely to be male than female, white than non-white, young, well-educated, and committed party identifiers, rather than independents (Musick 2004).

Unlike contributors, volunteers are not motivated to work on a campaign because it signals high status to others. Some are attracted to participate because

they are animated by particular policy goals anchored in ideological motives. Others are there because they enjoy the social interaction involved with the campaign, and consider campaign work a hobby. Some volunteers are associated with paid employees of the campaign, or the political party. They are there to help because they have been recruited by someone already involved in the campaign, often a paid staff member. Friendships are commonly the basis for recruitment into political activism (Klofstad 2007). Finally, there are volunteers, particularly those working in campaigns for higher level offices, who are hoping to obtain permanent positions after the election. For them, volunteering is an investment in skill development that they hope will pay-off as they climb the career ladder (Menchik and Weisbrod 1987).

Because of the low incidence of political voluntarism throughout the population, however, it has been challenging for investigators to obtain a definitive picture of their background, much less the locations from where they are most readily recruited. The fact that so many volunteers join the campaign as a result of recruitment through social network ties does suggest that there will be a geography of voluntarism, just as there is a spatial dimension to financial contributions (Wolpert 1988).

Geographic Substitution or Complementarity?

The notion that contributors to a campaign donate money because they do not want to volunteer time is a familiar one among those who manage campaigns, charities and other non-profits. If a person has more time than money, they will

give time. If an individual contributes in one form, this comes at the expense of them contributing in some other way. Some of the academic literature bolsters this view of time and money contributions as substitutes (Duncan 1999), although the balance of the research suggests that voluntary work and monetary donations are complements (Andreoni, Gale and Scholz 1996). Behavioral studies have suggested that the primary difference between volunteers and contributors is simply that the latter have greater income (Bryant, Jeon-Slaughter, Kang and Tax 2003), and that many do volunteer and contribute jointly (Freeman 1997). The reputable research by Verba, Schlozman and Brady (1995) also indicates that there is more complementarity than substitution among those engaging in the more demanding forms of participation.

Nevertheless, we might expect to find spaces of *volunteer involvement* that are distinct from spaces of *donor commitment*. With respect to campaign capital, we have already learned that campaign contributions are associated with the geographic concentration of financial prosperity. Metropolitan areas, white neighborhoods, and the social network ties that mature out of them also offer an indication of where one can most fruitfully prospect for political contributors (Gimpel, Lee and Kaminski 2006; Cho and Gimpel 2007).

Voluntarism, on the other hand, is associated with a somewhat different set of characteristics. Middle-income communities and rural areas, religious observance and civic commitment are all associated with the abundance of social capital that promotes voluntarism (Putnam 2000). Ordinarily, populations known for being highly affluent are not necessarily known for being as rich in *social* capital. If there

is some spatial disjunction in these two campaign assets, then volunteers would not be found in plentiful supply in the most affluent locales, but would instead emerge from small or mid-sized cities and towns, where an ethic of voluntarism is thought to thrive. Local variations in voluntary support for a campaign will be best predicted by indicators other than the purely *economic* composition of communities (Mohan and Mohan 2002; Wolpert 1988).

Campaigns, Geography, and the Constraints of Time and Space

That volunteers and contributors may occupy disjoint spaces is important because political campaigns in the United States are inherently geographic enterprises. Both candidate and campaign staff are constrained by time and space; candidates and their surrogates cannot be everywhere at once. Nevertheless, there is a public and media preference for personal rather than electronically mediated appearances by the candidate. For these reasons, decisions about travel and event scheduling are constantly in the foreground of any campaign.

From the political campaign's standpoint, the recruitment of volunteer labor can be a major source of cost savings – and one of the few resources that can compensate for a lack of financial resources. Volunteers have become far less important to campaigning over time, and it is fair to say that the rapid professionalization of campaigns has reduced the opportunity to volunteer (Green and Smith 2003; Kleidman 1994). Even so, a well-managed volunteer workforce can save a campaign tens-of-thousands-of-dollars that might otherwise go to a professional vendor (Green and Smith 2003). On the other hand, a tension has

often been observed between volunteers and professionals in political and social movement organizations. Professionals within the organization often view the two resources as substitutes; preferring to raise money rather than seek out volunteers (Zald and Ash 1966; Kleidman 1994; Staggenborg 1988). Certainly a mounting body of evidence suggests a substitution effect occurring over time, if not across space.

Perhaps much of the longstanding conflict between fundraising and volunteer recruitment within political organizations stems precisely from the fact that the two assets emerge from different places. First of all, if volunteers and donors are from different locations, their political interests and policy goals may differ, inasmuch as location is a signal of economic standing, occupation, and political ideology (Gimpel and Schuknecht 2003).

Secondly, distance between the locations where campaigns must prospect for volunteers and donors imposes its own costs. A campaign may find it challenging to commit resources to locations where volunteers are available while at the same time traveling to entirely different locations to raise money. From a scheduling standpoint, if donors and volunteers are substitutes, it likely signals that events designed to elicit donations cannot be expected to do the double-duty of recruiting volunteers, and vice versa. Instead, separate events and discrete locations will have to be scheduled, with additional effort appropriately budgeted.

Finally, allocating volunteer efforts to areas where they are not found to live may be very difficult on a sustained basis. The peculiar spatial distribution of voluntarism may present a difficult conundrum for campaign managers who

commonly target the most voter rich counties within their states (districts) for the most aggressive canvassing and outreach efforts. Larger cities and suburbs are a challenge because it is these locations where high levels of turnout are most needed but least dependable. In this sense, there could be a potentially troubling spatial-mismatch between the most participatory locations where volunteers are most available, and the least engaged areas where they are most needed. Unless volunteers are willing to travel, or be redeployed to other locales on a regular basis, this mismatch cannot be overcome and important campaign outreach goals will remain unmet.

Reckoning with the Effects of Scale

Many studies of campaign effects are confined to the use of a single fixed unit of aggregation at which all observations take place, commonly states or media markets (Shaw 1999a, 1999b; Herr 2002; Iyengar and Simon 2000). Data collection strategies are adopted for convenience, not because this is the scale at which the causal process actually works.

The theory we draw upon maintains that campaign stimuli interact with local population characteristics to trigger the social interactions that are productive of donor and volunteer mobilization. If this theory captures the truth, then we should not expect an analysis of large-scale aggregates to reveal much of a campaign effect. Perhaps one reason why studies of campaign influence have produced such mixed results is that scholars have been expecting these effects to emerge at unreasonably grand scales. By our account, the local settings associated with the

political engagement and recruitment process are not likely to be captured well at such a general level of observation. The variation productive of spatial peaks and valleys in the forms of political participation we are studying lie well *within* a state or media market. At the very least, investigators ought to conduct some cross-scale analyses to evaluate whether empirical findings hold up at different resolutions (Sheppard and McMaster 2004).

The notion that statistical results can vary with the scale of the observations is known as the *modifiable area unit problem* (Openshaw 1984). In our view, however, the modifiable area unit problem is not just a problem, but a highly useful spatial analytic tool (Alvanides, Openshaw and Macgill 2001, 141). Alternative zones or districts can be designed and the relationships statistically assessed using multiple scales. Rather than confining our analysis to the scales provided by government or agency conventions, we can examine effects at a broad variety of scales.

Because we use a Geographic Information System (GIS) to geocode the locations of all volunteers and contributors to the campaign, we are able to conduct statistical analyses of volunteer and contributor emergence at multiple scales of observation. We do this by dividing the study area into discrete zones or "lattice cells", and then estimating a model for each set of these zones (Fotheringham, Brunsdon and Charlton 2002). Our design offers a new method for determining the field over which key features of a citizen's geographic context stimulates their political participation. Whatever its size, this field is presumably rendered coherent

by social interaction, accompanying information flows, and subjective understandings of place location.

Dependent and Independent Variables

An advantage of this study is the capacity to examine alternative dependent variables for political participation. We can look at local campaign contributors and volunteers as well as gauge the amount contributed. These outcomes have never before been evaluated in this manner.

We should underline that those we have classified as "volunteers" are not necessarily people who spent time volunteering in the campaign, but instead added their name to a website list indicating that they would be willing to volunteer if called upon to do so. As is usually the case in typical solicitations for volunteer labor, far more names were added to the list as *potential* volunteers than actually spent time as a volunteer (for simplicity we will hereafter refer to these signatories simply as "volunteers"). Even so, those responding had to seek out the campaign website and add their names themselves – no names were added by the campaign staff – suggesting a high level of self-initiative *was* involved. Fortuitously for purposes of this research, the time and date each volunteer signed-up was precisely recorded.

In addition, precise records exist from the location and date that contributions arrived from throughout the state and from elsewhere. Amounts of contributions are also available. Our second dependent variable is simply the

number of donors who make donations daily through the course of the campaign, and our third dependent variable is the amount of the donation.

The explanatory variables of interest include population size of the geographic unit (in 100,000s), since we would clearly expect *ceteris paribus* larger numbers of volunteers and donors to emerge from locations containing more people. We include both median income and the percentage of the population that is in the highest income bracket (>$150,000), to establish whether participation rises with income, but rises most precipitously as one approaches those locales lying in the very highest income brackets.

The percentage of the population that is Non-Hispanic and white is included because surveys have consistently shown that political efficacy levels are higher among whites than among racial and ethnic minority groups.

We include the percentage of the population that is elderly (≥ age 65) because the literature on voluntarism points in somewhat different directions. Some studies suggest that the retired elderly have more time to volunteer, and hence we might expect greater voluntarism in those locations with an older age distribution. We also know that older people generally have more interest in and knowledge about politics. Donor studies have indicated that the elderly also have more money to contribute to campaigns and charities than those who are in younger age cohorts. On the other hand, we also know that political campaigns draw from the ranks of younger citizens, e.g., college students, and stay-at-home parents. Our effort here is to determine whether in the case at hand the campaign

found consistently higher incidence of voluntarism and financial contributions among elderly or younger populations.

If we are correct about the existence of persisting local spaces of political engagement and disengagement, past political characteristics of locations surely predict geographic variability in political involvement. We might expect additional volunteers to emerge in locations where conventional forms of participation, such as voting, traditionally run high. For this reason we control for the level of turnout in the 2004 presidential election, drawn from aggregating individual level turnout records from the Texas statewide voter file (using the GIS). Previous support for the candidate might prove to be a good predictor of volunteer and donor support for the political campaign. Our measure for previous support is the percentage of the vote won by the Texas Governor in the 2002 gubernatorial election. The competitiveness of a locale, measured in terms of its political division between Republican and Democratic support in the 2002 election, might also predict the extent of subsequent political mobilization. Here we hypothesize that a sizable share of the citizenry is animated by political conflict, rivalry, and the perception that political outcomes hang in the balance. These perceptions of political threat would be present and accessible in areas that are politically diverse but less so in locations dominated by one party or the other (Campbell 2006; Gimpel, Lay and Schuknecht 2003).

Temporal covariates may also be critical in predicting volunteer and donor activation. The most obvious of these is proximity to Election Day itself. Given that elections often begin in earnest in September, we include a (1,0) variable

capturing those days lying in the 65 day period between September 1 and the election, but we also include the simple count of days from the beginning of the year, based on the idea that voluntarism and donation activity is a straightforward linear function of time.

Because volunteers are often critically important to last minute canvassing and turnout operations, we also identify the final 72 hours before Election Day as a period where we might expect a significant up-tick in participation. The March primary might also be expected to generate news coverage and consequent mobilization. Although the Governor's re-nomination in 2006 was not contested in the primary, certainly the primary marks the period prior to the fall election where one can expect the greatest election-related news coverage.

The primary is also usually considered the official kickoff of the fall campaign, as the Democratic Party's candidate was selected. We identify the days one week prior and one week after the March 6 primary as the period where we hypothesize an increase in volunteer and donor enrollment. We also evaluate whether a widely viewed debate including the four gubernatorial candidates in early-October was productive or hurtful to participant prospecting.

Other political events of a non-campaign nature during 2006 might have proven to be either distracting to or supportive of the campaign's efforts to build support. The April-May legislative session to resolve a crisis of school financing is identified in our models as one of these periods. Following this special session, the governor signed various parts of the emergent compromise legislation during a ten-day tour of the state. We identify both of these periods by coding the pertinent

dates. Even though these were not official campaign-related events, per se, they could have served as a tool for stoking political excitement and boosting party activism.

Regular and Irregular Lattices

As we have discussed above in relation to scale effects, location is measured in several ways at more than one scale. First, we examine the DMA (media market or Designated Market Area) effects for Texas media markets (see Figure 1). Second, we examine the effects at a more local level, for Texas counties. Because DMAs and counties are asymmetrically shaped polygons, these structures are referred to in the parlance of spatial data analysis as an "irregular lattice" (Cressie 1993, Chapter 6).

The centrographic distribution of volunteers and contributors for an exemplary county is depicted in Figure 1, Harris County (Houston and vicinity). These aggregate distributions do reflect the long-standing population distribution of the county, and particularly the Republican population distribution. At a countywide scale, the pattern would appear to reflect considerable intersection between the volunteer and donor bases of support. The donor base is narrower, however, as it reflects the Houston area's centers of affluence. Naturally, this map tells us nothing of what the geography of contributor and volunteer support looks like *within* a particular neighborhood, or at a smaller scale, but it is *prima facie* support for the idea that donors can be found where volunteers are also found.

[Figure 1 about Here]

Geographic units such as DMAs and counties are to be distinguished from localities we then defined by a regularly spaced but arbitrary grid superimposed on the state to define cross-sectional units of observation (see Figure 2). Each cross-sectional unit is a cell, sometimes also referred to as a *quadrat*, of a specific dimension. With the grid placed over the state, observations on both X and Y variables are then drawn from within each quadrat, giving us a regular lattice of regions containing both continuous and discrete variables (Besag 1974).

To examine contextual effects on populations at greater and lesser levels of aggregation, our lattice approach permitted us to investigate cross-sectional units that ranged from just 10 miles square, to 100 miles square. Lattice cell sizes over 100 miles square began to approximate the size of media markets, and were judged to be less interesting, theoretically. Lattice cell sizes of less than 10 miles square were possible to generate, but resulted in large quantities of missing data.

[Figure 2 about Here]

To generate quantitative measures for the explanatory variables capturing electoral characteristics for the cross-sectional units, we aggregated block groups, voter precincts, and census tracts, lying within each lattice cell. In cases where a census geographic unit was not entirely contained within the boundaries of a lattice cell, we used a common method of including the unit if its areal centroid lay within the cell, but not otherwise. Since the lattice units encompass all territory lying within the state's boundaries, all precincts, census tracts and block groups are included within a lattice cell. The census data originate from official estimates for 2006 based on the 2000 census counts, and supplementary data collected from U.S.

census surveys during the intercensal period. The political data originate from the office of the Texas Legislative Counsel reports on precinct level returns from the 2004 and 2002 general elections. Data and measures for the timing of theoretically relevant events during the campaign were identified and recorded by the authors.

The Panel Data Model

With the state partitioned into observational units by the imposition of either a regular or irregular lattice, choice of a statistical model to fit to the data is contingent upon the nature of the dependent variable. The measures for volunteers and donors are distributed as "counts" and necessitate a statistical model appropriate for count dependent variables with overdispersion -- the condition in which the variance differs from the mean. Accordingly, we adopt a negative binomial estimation procedure appropriate for panel data (Cameron and Trivedi 1998; Long 1997).

By using fixed effects for particularly salient events, for each day from January 1st onward, we have controls for statewide shocks that result from campaign stimuli, or relatively quiet periods when campaign activity ebbed. The economic, demographic and political variables across locations allow us to investigate the trends in voluntarism, and donation activity over the course of the final 311 days of the campaign, gauging the influence of specific features of local electorates that may make them more or less participatory.

The specification for the negative binomial count models for volunteers and donors is as follows:

$$\tilde{\mu}_{it} = exp(\beta_1 Volunteers_{it}\{Donors_{it}\} + \beta_2 Population_{it} + \beta_3 Income_{it} + \beta_4 HighIncome_{it} + \beta_5 White_{it} + \beta_6 Elderly_{it} + \beta_7 Turnout_{it} + \beta_8 PerrySupport_{it} + \beta_9 Competition_{it} + \beta_{10} Primary_{it} + \beta_{11} Special_{it} + \beta_{12} BillSigning_{it} + \beta_{13} Day_{it} + \beta_{14} FinalMonths_{it} + \beta_{15} Debate_{it} + \beta_{16} FinalDays_{it} + \delta) + \delta_{it}$$

Where $\tilde{\mu}_{it}$ provides an estimate of the count of volunteers (or contributors) for the i^{th} location on the t^{th} day. *Volunteers {Donors}* permits a direct examination of the complementarity hypothesis, by estimating the influence of the presence of donors on volunteers at location *i* on day *t* when volunteers is the dependent variable, and the reverse when donors is the dependent variable. *Population* is the population size (in hundred-thousands) of location *i* on day *t*. *Income* is the median household income (in thousands) at location *i* on day *t*. *High Income* captures the locations of extremely affluent residents and is measured as the percent of the population earning over $150,000 per year. *White* is the percentage of the population at each location that is non-Hispanic white. *Elderly* is the percentage over age 65. *Perry Support* is the percentage voting for Governor Perry in the 2002 election; *Turnout* is the percentage turning out in the 2004 presidential general election; and *Competition* is the competitiveness of the 2002 U.S. Senate and Gubernatorial general elections combined for each location *i*.[2]

For the time-related covariates, *Day* is simply the day of the year numbered consecutively from January 1 through Election Day. *Primary* is identified as the days one week prior to and one week after the March 2006 primary. *Special Session* corresponds to the days during the April-May legislative session convened to resolve the state's school funding crisis. *Bill Signing* refers to the days in late May

[2] For competitiveness, we use a familiar formula of 100 – |[Rep% - Dem%]|.

when the Governor toured the state signing the school funding legislation voted out by the Texas legislature. *Final Months* refers to the days from September 1 to Election Day, when the campaign moved into its final and most intense phase; *Final Days* include the last three days of the election, during which mobilization activity is typically at its peak. *Debate* refers to the week following the one widely viewed debate with all of the candidates that was held on October 6, 2006.

The expression δ_{it} represents the negative binomial error term with unobserved heterogeneity, assumed to have a gamma distribution (Long 1997, 231-232); sometimes the negative binomial model is referred to as a *Poisson-gamma* model. Estimation proceeds with maximum likelihood. Because of the exponential transformation used to ensure that negative binomial estimates are non-negative, the model's coefficients are not easy to interpret as in straightforward linear models. Instead, we interpret the effect of appearances by computing an incident rate ratio (IRR) for the statistically significant coefficients (Long 1997, 224-225).

For the model capturing contribution amounts, we abandon the count framework and utilize time-series cross-sectional generalized least squares estimation, with first order autoregressive error terms AR(1).[3] Results from post-estimation tests suggest that autocorrelation has, in every case, been accounted for satisfactorily by modeling it as a first order process. Finally, we also made the considerable effort to examine the models for cross-sectional spatial dependency using routines developed for *Matlab™* by LeSage (2005), drawing on work by

[3]Remaining autocorrelation is assessed using the locally best invariant statistic, evaluating whether $\rho=0$ (Baltagi and Wu 1999).

Elhorst (2003). The results from these tests were statistically insignificant in every case.

Results for Volunteers

Table 1 reports our estimates for the number of volunteers expected for each unit of observation and day. First, it is clearly true that the presence of contributors in a locale enhances the probability that we will find volunteers at most of the scales of aggregation we examine, but the complementarity is most pronounced at the 10-mile square lattice cell size, where every single person increase in the number of local donors is associated with a 2.4 percent increase in the number of volunteers. At the county level, this impact is just 1.2 percent, and at the DMA level it is positive but generative of only 0.6 percent more volunteers. Although variable, it appears that the predominant pattern is one of gross complementarity rather than substitution.

Population size is unmistakably important, although its contribution does vary by the scale of the observational units. For the 10 mile square lattice cells, for example, a 100,000 increase in population elevates the volunteer count by 35 percent, clearly suggesting that voluntarism is a small scale phenomenon characteristic of dense social networks. This effect drops precipitously to 7 percent at 20 miles, then diminishes to just under 1 percent by the time lattice cells increase to 100 miles square. For counties, a 100,000 person increase in size increases voluntarism by 2.7 percent; and for DMAs, just 1.2 percent. Studies

looking for campaign effects on volunteers at these broader scales of aggregation are not likely to find a substantively large effect.

The results for median income also vary, but drop to statistical insignificance at extreme lattice cell sizes and at the DMA level. Higher median income is associated with greater voluntarism at the county level, by about 3.7 percent, and for lattice cells at 10, 30 and 40 miles square. Notably, however, the highest income locations are not productive of voluntarism except at the smallest 10-mile scale. Taken in combination, the results for rising affluence indicate that the middle income status of locations does promote volunteer recruitment, but at locations with exceedingly high income, volunteers only emerge at small scales (see Table 1), again suggesting complementarity.

The results for the racial complexion of locations indicate that volunteer recruitment is mostly unrelated to racial and ethnic diversity. Volunteers are found not only in the most rural and white areas of the state, but also in more diverse cities and suburbs. Campaign volunteers are *not* found springing up among elderly populations. In fact, it would appear that a younger age distribution promotes voluntarism across the board, except at the very broadest scales of aggregation where there is no statistically significant relationship.

[Table 1 about Here]

Among the political variables, there is certainly support for the idea that areas of high turnout in previous elections generate greater voluntarism, consistent with our expectations based on the geography of political capital. Previous political competitiveness also promotes greater activism at smaller scales of aggregation,

e.g., at the municipal and neighborhood levels. We can see, however, that volunteers do not sign-up as a consequence of competitiveness occurring at broader, regional levels (see Table 1).

As for the temporal distribution of voluntary activity, the primary pattern we see is simply early vs. late. Volunteers do not enroll with the campaign as a result of the March primary, the special legislative session, or coincident with the Governor's bill signing publicity in May. Only our variables representing day of the year and for the final months of the campaign show an important increase in volunteer sign-ups. Each additional day closer to Election Day generates a 1.7 percent increase in volunteers at 10 miles of scale, and this effect is largely scale invariant. As for the effect of the final months of the campaign, this uptick varies but not linearly with scale: ranging from a 32 percent jump for the 10x10 quadrats; a 49 percent increase for the 20x20 mile quadrats; a 24 percent increase at 100 miles of scale; and a 61 percent increase at the media market level. Surprisingly, the final 72 hours of the campaign actually drop the number of volunteer sign-ups. If volunteers have not enlisted on the campaign website before then, it would appear to be too late to expect them to afterward.

Results for Contributors and Contribution Amounts

The results for Republican campaign volunteers were reasonably clear-cut. They emerge from larger cities, younger populations, middle income locations, and from areas with a history of higher turnout. A localized sense of competition promotes voluntarism, and they tend to involve themselves late in the campaign

rather than early-on. Having contributors in a location also predicts the presence of volunteers, suggesting gross complementarity, consistent with studies by economists (Andreoni and Scholz 1998; Andreoni, Gale and Scholz 1996).

For donors, we see a few similarities but also some critical differences (see Table 2). While the presence of volunteers does predict the number of campaign contributors the extent of complementarity drops at broader scales of aggregation. Specifically, the effect we observe is a 7 percent increase in contributors for each new volunteer at the 10 mile quadrat size, but only a 1.8 percent increase at a scale ten times greater. At the DMA level, we can expect only a 1.6 percent increase in contributors for every new volunteer, and an intermediate 2.8 percent increase at the county level. Clearly, incidences of voluntarism best predict the presence of donors at small scales of aggregation.

Population size matters more often than not, suggesting that both donors are volunteers are to be found in the state's more metropolitan areas. A few important dissimilarities stand out, however. Donors, unlike volunteers, are to be found in areas that are *less white*, overall – again pointing to larger cities rather than smaller cities and towns. Nevertheless, donors emerge in the most affluent areas (≥$150,000) in these more populated and diverse locales, whereas this was true of volunteers solely at the very smallest 10x10 scale. Finally, political competition does not promote the spatial incidence of donors the way it does volunteers. Moreover, donations are positively related to higher turnout, but mostly independent of the local level of past support for the Governor.

[Table 2 about Here]

From a temporal standpoint, we can see no steady linear increase in contributions as we move closer to Election Day. The fall is a good time to harvest contributions, and in that sense we observe the same contrast between early and late in the calendar that we did for volunteers. Even so, the rise in donations in the fall months is not nearly as precipitous as it was for volunteers, suggesting a more even flow of financial contributions throughout the campaign cycle. The period immediately after the October debate proved to be an excellent opportunity to collect additional donations, as it provided the Governor with a platform to showcase his leadership and defend his record, thereby consolidating his frontrunner position. His solid performance seems to have triggered greater contributions, though not greater *amounts* (see Table 3), in the days that immediately followed. Contributions also flow in right up through Election Day, showing no drop-off at the end as we observed with volunteers.

As for the amounts contributed, shown in Table 3, these exhibit the pronounced relationship of the geography of wealth to the geography of fundraising. The largest sums of money flow in from densely populated areas with large numbers of volunteers and contributors. These are urban locations where median income is not always high, but where there are concentrations of very affluent citizens at the high end of the income distribution. At the very smallest scale, the 10 x 10 mile quadrat, race also matters, as predominantly white areas contribute more than those that are more racially mixed. Neither more nor less money is contributed from locations where Perry ran strong in the previous contest,

indicating the spatial disunion between financial and electoral support found by others (Gimpel, Lee and Kaminski 2006).

[Table 3 about Here]

Temporally, the statistical patterns for the amount of money raised are not appreciably different than the number of contributors who give. Late in the campaign is better for larger contributions than early. The campaign seems to have collected less money, but more contributors overall, immediately following the October debate, perhaps because the governor seemed less threatened by his rivals following a strong performance (see Table 3).

Discussion

This much is clear: GOP volunteers and donors are much more likely to emerge out of larger cities and affluent areas with some history of past political division, rather than out of politically homogeneous areas of lower income and sparse population, where Republican electoral support runs strongest. These facts point to geographic complementarity of capital and labor more than substitution of these resources. If substitution does exist, it lies well *within* major metropolitan areas, perhaps at smaller scales than we have investigated here. Perhaps contributions of money and time are only geographic substitutes for donors who contribute sizable amounts, but geographic complements among those who give smaller sums.

Temporally, the distribution of volunteers and donors are also gross complements, as both rise sharply during the last two months of the campaign.

Having said that, the donation stream is still far more evenly distributed across time than the closing surge in volunteer support. The fundraising staff is busy year round, scheduling events well before the fall campaign heats-up. By contrast, the field staff often reserves the deployment of volunteers until the final weeks of the campaign.

The good news is that because any substitution of capital and labor occurs well within metropolitan areas at smaller scales, the costs associated with prospecting for both at the same time are somewhat reduced over what they could be. It's not as if the volunteers emerge hundreds of miles away from the bulk of the donors. The difference is tantamount to having to travel across town, from one group to the next, rather than across a county or region of the state.

While donors, and particularly *large* donors, are highly concentrated in the most affluent locations of metropolitan areas, volunteers remain more evenly distributed across a much larger number of middle-income and upper-middle income neighborhoods (see Figure 1). This means that volunteers still likely represent a broader range of political interests than the major contributors do. In addition, the fact that many of the volunteers emerge out of the most highly active neighborhoods is to be expected, but is not a good sign from a campaign management standpoint. Volunteers are needed most in less active, or in marginally active neighborhoods, not areas that can be counted on to vote. The campaign does itself no good to canvass in towns and neighborhoods where turnout is already high. Unless these volunteers exhibit a willingness to be redeployed to more needy areas,

where they may be less familiar with the terrain, their efforts may well be wasted on people already certain to vote.

Finally, our research design allows us to comment on the scale at which these campaign effects are most likely to emerge. While some effects appear to be largely scale invariant, most are not. Generally, we can say that the greater the level of aggregation the weaker the magnitude and significance of the effect. The role of median income in promoting voluntarism is a very good example. Above a lattice cell size of 40 square miles, the impact of rising median income on the daily volunteer count is statistically indistinguishable from zero. The same is true for the age distribution. At very large scales of aggregation, 100 square miles, and at the DMA level, the proportion of the population that is elderly does not sufficiently vary enough to be of consequence to volunteer activation.

Campaign effects are often weak at broad scales of aggregation. This is because the field over which these effects operate on individuals is far smaller; being the product of local spatial interaction and local identities. Our recommendation is that researchers adopt designs like this one that allow them to drop down in scale, consistent with theories of social influence in the recruitment and social influence process. If the decision to politically participate in these ways is a network dependent one, as a mounting body of evidence suggests, then atheoretical approaches at overly general levels of aggregation will continue to produce disappointing results.

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Table 1. Spatial and Temporal Contextual Influences on Volunteer Recruitment to the Campaign, at Variable Levels of Aggregation									
Variables	DMA	County	Lattice10	Lattice20	Lattice30	Lattice40	Lattice50	Lattice80	Lattice100
Location									
Contributors	.006* (.003) [1.01]	.012* (.005) [1.012]	.024* (.012) [1.024]	.014 (.007)	.011 (.006)	.011* (.006) [1.011]	.013* (.005) [1.013]	.011* (.004) [1.011]	.008* (.003) [1.008]
Population (100,000s)	.012* (.005) [1.012]	.027* (.007) [1.027]	.303* (.042) [1.354]	.065* (.014) [1.067]	.041* (.011) [1.042]	.036* (.011) [1.037]	.008 (.006)	.014* (.005) [1.104]	.009* (.004) [1.009]
Median Income (1,000s)	.089 (.067)	.037* (.013) [1.038]	.010* (.012) [1.010]	.012 (.008)	.026* (.012) [1.026]	.028* (.014) [1.028]	.009 (.016)	.028 (.042)	-.019 (.034)
% High Income	-.336 (.223)	-.055 (.056)	.063* (.024) [1.065]	-.001 (.033)	-.021 (.045)	-.088 (.059)	.056 (.076)	-.057 (.127)	.075 (.099)
% White	-.012 (.010)	.008 (.005)	.0005 (.003)	.012* (.004) [1.012]	.0009 (.006)	.009 (.006)	.003 (.005)	.005 (.008)	.002 (.009)
% Elderly	-.05 (.081)	-.156* (.019) [.856]	-.112* (.013) [.894]	-.147* (.016) [.863]	-.114* (.020) [.892]	-.101* (.022) [.904]	-.146* (.027) [.864]	-.079* (.035) [.924]	-.031 (.042)
% Turnout 2004	-.005 (.011)	.011* (.004) [1.011]	-.0003 (.003)	.001 (.004)	.011* (.005) [1.011]	.005 (.005)	.016* (.005) [1.016]	.010 (.007)	.047* (.021) [1.048]
% Perry Support 2002	.009 (.013)	-.019* (.008) [.981]	-.007 (.004)	-.012* (.006) [.988]	-.007 (.006)	-.010 (.007)	.004 (.006)	-.002 (.010)	-.011 (.009)
Competitive 2002	.007 (.004)	.002 (.002)	.003* (.001) [1.003]	.004* (.002) [1.004]	.005* (.002) [1.005]	.004 (.002)	.005 (.002)	.002 (.003)	.003 (.003)
Timing									
Day of Year	.014* (.001) [1.014]	.015* (.0008) [1.015]	.017* (.0007) [1.017]	.015* (.0008) [1.015]	.015* (.0008) [1.015]	.016* (.0008) [1.016]	.016* (.0008) [1.016]	.015* (.0008) [1.015]	.015* (.0008) [1.015]
March Primary	-.380 (.465)	-.608 (.460)	-.664 (.458)	-.663 (.459)	-.671 (.459)	-.663 (.459)	-.639 (.460)	-.625 (.461)	-.353 (.393)
Special Session	-2.021*	-2.334*	-2.073*	-2.411*	-1.729*	-1.87*	-1.989*	-2.110*	-1.523*

	(.507) [.133]	(.505) [.097]	(.414) [.126]	(.505) [.090]	(.360) [.177]	(.384) [.154]	(.414) [.137]	(.453) [.121]	(.324) [4.586]
Bill Signing	-1.471* (.453) [.230]	-1.820* (.451) [.162]	-2.003* (.450) [.135]	-1.907* (.451) [.149]	-1.919* (.451) [.147]	-1.932* (.451) [.145]	-1.89* (.451) [.151]	-1.811* (.451) [.163]	-1.754* (.412) [.173]
Final Months	.478* (.123) [1.613]	.450* (.093) [1.568]	.275* (.079) [1.316]	.401* (.086) [1.493]	.366* (.087) [1.442]	.328* (.086) [1.388]	.316* (.090) [1.372]	.420* (.096) [1.522]	.218* (.091) [1.244]
October Debate	-.031 (.117)	-.098 (.088)	-.136 (.075)	-.133 (.082)	-.113 (.082)	-.130 (.084)	-.096 (.085)	-.130 (.093)	-.094 (.091)
Final 72 Hours	-.740* (.190) [.477]	-.789* (.138) [.454]	-.861* (.118) [.423]	-.781* (.125) [.458]	-.827* (.131) [.437]	-.885* (.134) [.413]	-.804* (.135) [.448]	-.802* (.144) [.448]	-.630* (.131) [.533]
Constant	-7.204* (1.507) [.0007]	-5.261* (.607) [.005]	-6.196 (.390)	-5.373* (.470) [.005]	-6.330* (.638) [.002]	-6.014* (.656) [.002]	-6.105* (.608) [.002]	-5.939* (1.085) [.003	-6.954* (1.263) [.001]
r	1.670	2.351	3.536	2.622	2.225	1.973	1.715	1.338	1.598
s	2.184	.498	.467	.430	.464	.436	.531	.583	1.175
N	6,220	78,994	283,010	136,840	89,879	60,956	45,406	22,392	16,794
T	311	311	311	311	311	311	311	311	311
Log-Likelihood	-3,188	-6,521	-10,405.12	-8,096	-7,593	-7,088	-6,531	-5,382	-5,740
Significance χ^2	p≤.0001	p≤.0001	p≤.0001	p≤.0001	p≤.0001	p≤.0001	p≤.0001	p≤.0001	p≤.0001

Cross-sectional Time Series Negative Binomial Regression, Maximum Likelihood Estimation.
Dependent variable=number of volunteers signing-up by day and location
Cell entries are regression coefficients (standard errors); incident rate ratios are reported in square brackets for statistically significant coefficients
*p≤.05 two-tailed tests

Table 2. Spatial and Temporal Contextual Influences on Donor Participation in the Campaign, at Variable Levels of Aggregation									
Variables	DMA	County	Lattice10	Lattice20	Lattice30	Lattice40	Lattice50	Lattice80	Lattice100
Location									
Volunteers	.016* (.003) [1.016]	.028* (.005) [1.028]	.069* (.013) [1.071]	.037* (.008) [1.038]	.032* (.006) [1.033]	.028* (.005) [1.028]	.026* (.004) [1.026]	.020* (.004) [1.020]	.018* (.003) [1.018]
Population (100,000s)	-.003 (.003)	.012* (.004) [1.012]	.184* (.024) [1.202]	.051* (.009) [1.052]	.003 (.007)	.028* (.006) [1.028]	.010* (.004) [1.01]	.006* (.003) [1.006]	.004 (.003)
Median Income (1000s)	.018 (.035)	.010 (.009)	.018* (.005) [1.018]	.012 (.006)	.025* (.009) [1.025]	.033* (.009) [1.034]	.008 (.012)	.049* (.022) [1.050]	.042* (.018) [1.043]
% High Income	.007 (.132)	.096* (.036) [1.101]	.012 (.017)	.014 (.023)	.080* (.032) [1.083]	-.029 (.038)	.101* (.048) [1.106]	-.046 (.067)	.059 (.059)
% White	-.017* (.006) [.983]	-.004 (.003)	-.006* (.003) [.994]	.003 (.003)	-.012* (.003) [.988]	-.010* (.003) [.990]	-.011* (.003) [.989]	-.009* (.004) [.991]	-.019* (.006) [.981]
% Elderly	-.113* (.058) [.893]	-.014 (.011)	-.010 (.009)	-.035* (.011) [.966]	.002 (.014)	-.004 (.014)	-.027 (.017)	.004 (.021)	.054* (.026) [1.055]
% Turnout 2004	.0003 (.007)	.007* (.003) [1.007]	.0007 (.002)	.002 (.003)	.004 (.003)	.007* (.003) [1.007]	.011* (.003) [1.011]	.008* (.004) [1.008]	-.009 (.014)
% Perry Support 2002	.024* (.008) [1.024]	-.009 (.005)	-.006 (.003)	-.008* (.004) [.992]	.002 (.004)	-.002 (.004)	.002 (.004)	-.003 (.006)	.008 (.005)
Competitive 2002	.003 (.003)	-.001 (.001)	.001 (.001)	.0008 (.001)	.002 (.002)	.0001 (.002)	-.004* (.002) [.996]	-.002 (.002)	-.001 (.002)
Timing									
Day of Year	-.0002 (.0004)	-.00002 (.0003)	-.0001 (.0002)	.00004* (.0003)	-.00008 (.0003)	-.0001 (.0003)	-.0003 (.0003)	-.0002 (.0003)	-.0002 (.0003)
March Primary	-.119 (.122)	-.348* (.096) [.706]	-.349* (.079) [.705]	-.377* (.090) [.686]	-.350* (.089) [.705]	-.427* (.091) [.652]	-.327* (.090) [.721]	-.310* (.097) [.733]	-.231* (.090) [.794]
Special Session	-.772* (.117)	-1.027* (.095)	-.966* (.076)	-1.005* (.086)	-1.021* (.087)	-.898* (.081)	-.920* (.086)	-.671* (.082)	-.817* (.085)

	[.462]	[.358]	[.381]	[.366]	[.360]	[.407]	[.399]	[.511]	[.442]
Bill Signing	-1.178*	-1.513*	-1.884*	-1.666*	-1.713*	-1.713*	-1.576*	-1.533*	-1.701*
	(.192)	(.162)	(.163)	(.161)	(.166)	(.164)	(.160)	(.166)	(.176)
	[.308]	[.220]	[.152]	[.189]	[.180]	[.180]	[.207]	[.216]	[.183]
Final Months	.403*	.322*	.378*	.335*	.334*	.351*	.372*	.340*	.331*
	(.085)	(.059)	(.048)	(.054)	(.054)	(.054)	(.057)	(.061)	(.060)
	[1.496]	[1.380]	[1.459]	[1.398]	[1.397]	[1.420]	[1.451]	[1.405]	[1.392]
October Debate	.591*	.693*	.730*	.686*	.666*	.735*	.697*	.660*	.746*
	(.115)	(.076)	(.060)	(.069)	(.071)	(.069)	(.073)	(.081)	(.078)
	[1.806]	[1.999]	[2.075]	[1.986]	[1.946]	[2.085]	[2.008]	[1.935]	[2.109]
Final 72 Hours	.301	.438*	.423*	.429*	.459*	.532*	.445*	.404*	.573*
	(.173)	(.111)	(.090)	(.101)	(.102)	(.109)	(.108)	(.117)	(.111)
		[1.550]	[1.527]	[1.536]	[1.582]	[1.702]	[1.560]	[1.498]	[1.774]
Constant	-1.881*	-1.790*	-2.344*	-1.955*	-2.975*	-2.659*	-1.348*	-2.773*	-2.824*
	(.949)	(.388)	(.263)	(.316)	(.434)	(.440)	(.399)	(.631)	(.753)
	[.152]	[.167]	[.096]	[.142]	[.051]	[.070]	[.260]	[.062]	[.059]
r	1.533	2.200	3.081	2.732	2.104	1.812	1.400	1.176	1.075
s	4.048	.563	.335	.510	.527	.625	.608	.868	1.297
N	6,220	78,994	283,010	136,840	89,879	60,956	45,406	22,392	16,794
T	311	311	311	311	311	311	311	311	311
Log-Likelihood	-6,670	-14,618	-23,119	-17,981	-16,976	-16,524	-15,128	-12,600	-13,200
Significance χ^2	p≤.0001	p≤.0001	P≤.0001	p≤.0001	p≤.0001	p≤.0001	p≤.0001	p≤.0001	p≤.0001

Cross-sectional Time Series Negative Binomial Regression, Maximum Likelihood Estimation.
Dependent variable=number of contributors by day and location
Cell entries are regression coefficients (standard errors); incident rate ratios are reported in square brackets for statistically significant coefficients
*p≤.05 two-tailed tests

Table 3. Spatial and Temporal Contextual Influences on the Amount Contributed to the Campaign, at Variable Levels of Aggregation									
Variables	DMA	County	Lattice10	Lattice20	Lattice30	Lattice40	Lattice50	Lattice80	Lattice100
Location									
Volunteers	154.07*	226.95*	62.31*	86.67*	110.32*	113.48*	211.87*	86.99*	178.97*
	(36.09)	(13.50)	(10.07)	(11.55)	(13.56)	(15.45)	(18.57)	(23.23)	(27.33)
Contributors	910.20*	1335.66*	1422.50*	1307.25*	1263.95*	1149.63*	1212.98*	976.13*	1059.75*
	(23.44)	(8.82)	(6.48)	(7.47)	(8.71)	(10.38)	(12.24)	(15.91)	(18.96)
Population (100,000s)	14.50	54.12*	75.97*	74.49*	62.70*	63.19*	62.16*	50.54*	44.75*
	(12.38)	(5.03)	(7.93)	(6.53)	(6.25)	(8.85)	(8.35)	(11.46)	(8.77)
Median Income (1,000s)	-8.95	-3.82*	-2.41*	-4.20*	-6.39	-11.12	-25.54*	33.41	-9.37
	(79.97)	(3.96)	(.74)	(2.00)	(3.34)	(6.46)	(10.91)	(25.86)	(37.08)
% High Income	629.80*	-14.09	2.35	6.94	30.83*	36.11	17.04	-41.90	58.57
	(355.61)	(15.72)	(2.85)	(8.29)	(13.66)	(29.74)	(41.60)	(89.35)	(122.17)
% White	8.16	.18	.68*	.74	.76	.41	2.88	-2.76	.62
	(16.93)	(1.25)	(.32)	(.76)	(1.14)	(1.92)	(3.13)	(5.98)	(9.03)
% Elderly	26.56	5.39	-.53	2.24	4.54	4.28	2.59	20.36	-7.74
	(155.76)	(4.63)	(1.22)	(2.74)	(4.15)	(7.50)	(12.30)	(26.08)	(40.03)
% Turnout 2004	-14.45	.19	.10	-.02	-.46	-1.24	-1.83	-6.38	-3.18
	(15.44)	(.87)	(.27)	(.60)	(.96)	(1.56)	(2.68)	(5.39)	(8.99)
% Perry Support 2002	-17.69	.21	-.41	-.27	-.19	.77	.03	-5.85	-1.30
	(17.86)	(1.39)	(.35)	(.76)	(1.21)	(2.08)	(3.02)	(7.30)	(10.35)
Competitive 2002	-.73	-.48	-.22	-.32	-.57	-.56	-.44	-.63	1.70
	(6.01)	(.44)	(.12)	(.26)	(.39)	(.63)	(1.08)	(1.97)	(2.97)
Timing									
March Primary	569.65	61.18	12.89	28.61	52.08	76.00	116.28	203.24	354.48
	(527.52)	(37.67	(9.72)	(21.10)	(35.11)	(55.51)	(81.76)	(173.61)	(285.94)
Special Session	60.89	34.25	8.85	16.15	24.78	28.25	53.17	33.84	105.76
	(394.47)	(28.09)	(7.25)	(15.76)	(26.20)	(41.47)	(61.10)	(129.76)	(213.77)
Bill Signing	-218.33	18.37	4.33	6.93	9.33	1.15	16.49	-59.54	-34.10
	(527.94)	(37.68)	(9.72)	(21.10)	(35.11)	(55.52)	(81.77)	(173.68)	(286.10)
Final Months	1074.89*	52.80*	19.97*	42.54*	68.34*	1114.10*	125.07*	404.35*	515.19*
	(308.37)	(21.55)	(5.55)	(12.08)	(20.11	(31.86)	(47.02)	(100.25)	(165.64)
October Debate	-1313.83	-176.70*	-50.61*	-95.14*	-152.92*	-208.87*	-306.53*	-512.16*	-889.15*
	(737.39)	(52.82)	(13.63)	(29.48)	(49.13)	(77.52)	(114.08)	(242.43)	(399.39)
Final 72 Hours	1219.32	-113.99	-34.74	-69.65	-107.59	-162.23	-225.28	-459.52	-721.17
	(996.50)	(71.86)	(18.56)	(39.94)	(66.69)	(104.95)	(154.27)	(327.83)	(539.86)
Constant	-542.95	27.22	70.98	58.63	71.36	191.40	585.15	-615.59	-118.69
	(2055.43	(146.26)	(34.60)	(76.98)	(127.12)	(205.72)	(341.86)	(645.11)	(1075.72)

ρ	.10	.06	.05	.09	.08	.10	.11	.10	.10
Σe	7954.47	2121.04	1030.19	1508.60	2001.67	2475.20	3033.92	4415.90	5772.78
Baltagi-Wu LBI	1.80	1.89	1.89	1.82	1.85	1.81	1.79	1.80	1.79
R^2 within	.21	.23	.15	.18	.20	.19	.22	.18	.23
R^2 between	.98	.91	.76	.85	.91	.88	.88	.92	.96
R^2 overall	.28	.29	.18	.24	.26	.25	.28	.24	.30
N	6,220	78,994	276,790	136,840	84,281	53,803	37,942	17,727	11,196

Cross-sectional Time Series Regression with Random Effects, GLS Estimation with AR(1) Disturbances
Dependent variable=amount contributed by day and location
Cell entries are regression coefficients (standard errors);
*p≤.05 two-tailed tests

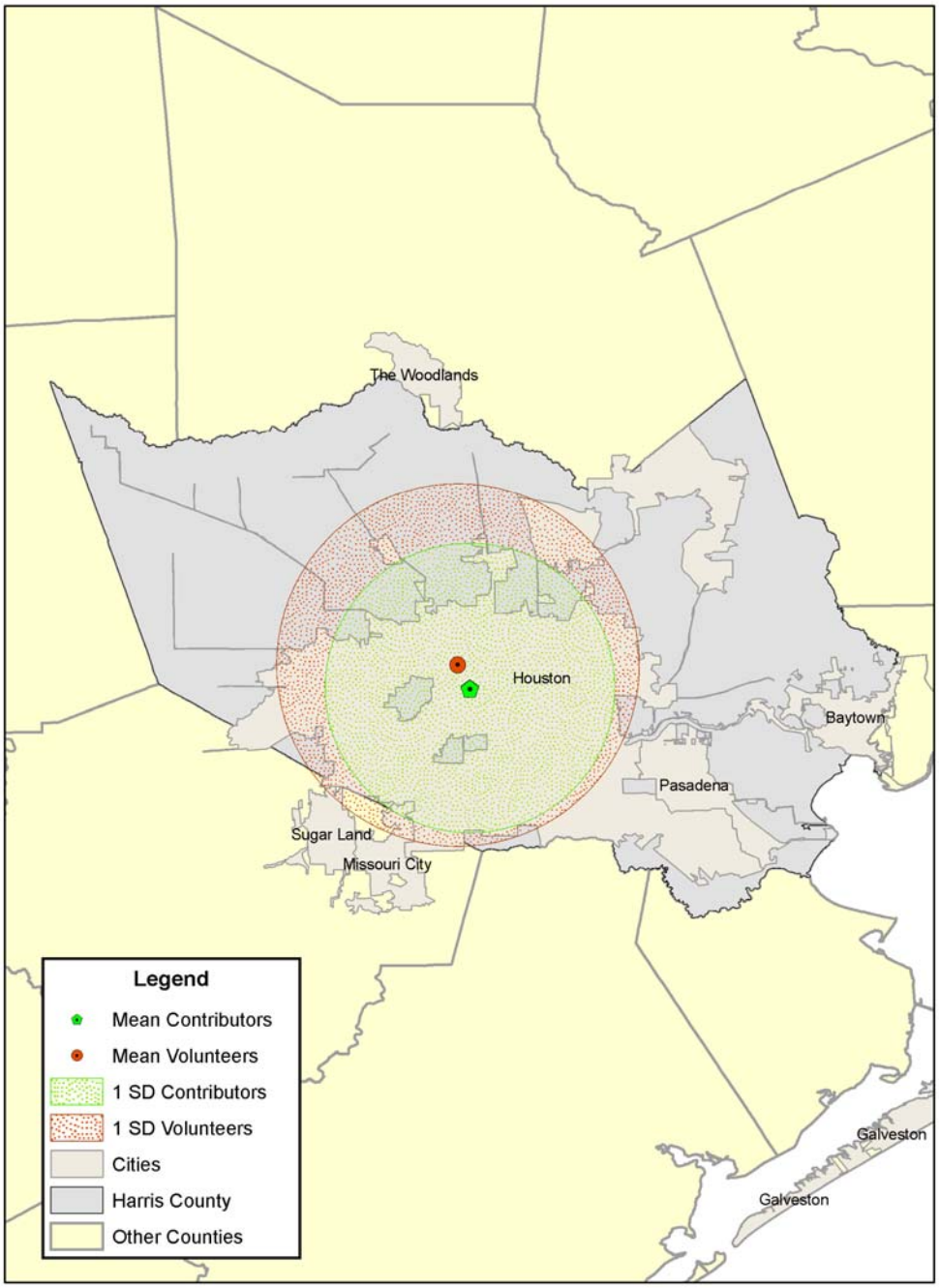

Figure 1. Centrography of Republican Contributors and Volunteers in Harris County, Texas

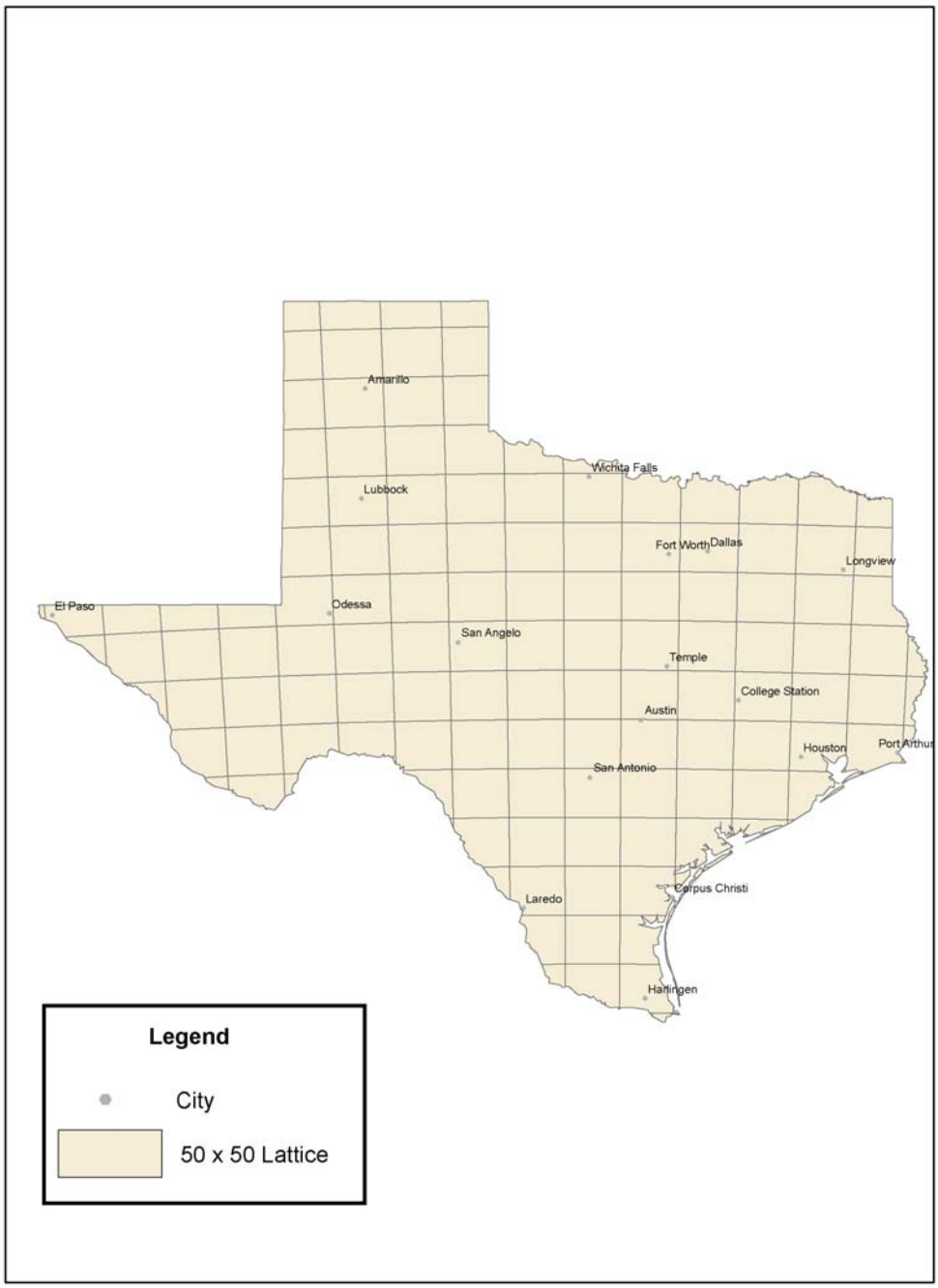

Figure 2. Depiction of 50 x 50 Mile Lattice Cells for Texas