Summer 2010

District characteristics and the representational relationship

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DISTRICT CHARACTERISTICS AND THE REPRESENTATIONAL RELATIONSHIP

by

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An Abstract

Of a thesis submitted in partial fulfillment
of the requirements for the Doctor of
Philosophy degree in Political Science
in the Graduate College of
The University of Iowa

July 2010

Thesis Supervisor: Professor Caroline J. Tolbert

ABSTRACT

Districts are intermediary legislative institutions that structure the relationship between constituents and legislatures. Situated between citizens and their elected representatives, districts mediate citizen-legislator interaction, and may have wide-reaching effects on the representational relationship. By creating a political community, defining its interests by delineating its scale and boundaries, and structuring interaction between constituents and their elected representatives, districts shape the representational relationship. District characteristics alter the representational experience for constituents with very real consequences for trust in government, evaluations of legislative institutions and representatives, perceptions of responsiveness, and the degree and type of constituent-legislator communication.

Three district characteristics are examined: the population size of legislative districts (constituency size), the shape of district boundaries (geographical compactness, and the extent to which district boundaries follow pre-existing political subdivision boundaries (boundary coterminousness). Using Census data and GIS, measures of these characteristics are created for every state legislative and congressional district (post-2000 redistricting) in the United States. These characteristics are combined with public opinion data to test for their influence on attitudes toward government, legislative institutions, and legislators, as well as with data on the closeness of the representational relationship. The findings suggest constituency size is an important determinant of evaluations of government, institutions, and legislators at both the state and congressional level. The geographical districting principles of compactness and coterminousness influence the

amount of constituent-legislator communication, knowledge of representatives, and in-person contact with representatives, primarily at the congressional district level.

For decades, legislative districts have been drawn as if they matter only for the electoral success of legislative candidates and the partisan and racial groups those candidates represent. The primary contribution of this work is to show that districts matter beyond defining the dominant partisan or racial attributes of district constituents. Districts influence how representation is experienced by constituents.

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CHAPTER 1. THE SIZE AND SHAPE OF REPRESENTATION

Sixty-two members serve in Nevada's state legislature. Forty-two serve in the Assembly, twenty in the Senate. Each legislator in the Assembly represents (on average) 47,500 residents, based on the 2000 Census population data. But Nevada's population is booming. In the 1990s Nevada experienced a 66% population growth rate; by 2000, just under two million residents called the Silver State home. Nevada is projected to keep growing: according to current Census estimates, Nevada's population will *double* by 2030. If Nevada does not increase the size of its legislature, the 42 members of the Assembly will represent four million residents or almost 100,000 per district. State senators will likely see district populations of 200,000 persons. Nevada, however, is fortunate. It has regularly altered the size of the legislature. And it can do so by statue rather than constitutional amendment.

Of course, Nevada is not a large state. Large population states see more staggering numbers. California's Assembly has had eighty members since the 1860's. Eighty members represented 380,000 Californians in 1861; eighty members were charged with representing thirty-three million in 2000. By 2030, unless California increases the size of the Assembly, eighty members will be elected to represent the interests of a projected *forty-four million* people. In other words, each member of the Assembly today represents more Californians than it took the entire Assembly to represent in 1860, and the representational demands are growing rapidly. Are California politicians so skilled as to accomplish the representational work it would have taken eighty-six of their counterparts 150 years ago to accomplish? Or is the quality of representation in California different today?

For decades Illinois' 20th congressional district consisted of a dozen or so western counties grouped along the Mississippi. The western edge was the Mississippi – stretching from just north of the confluence of the Des Moines and the Mississippi rivers to St. Louis in the south. From there the district boundary ran north along the borders of Jersey, Greene, and Scott counties, jutting east to encompass Menard and Morgan, and then back to river. Its shape resembled Wisconsin's, albeit a slightly disfigured version. In the redistricting prior to the 1952 election, the Illinois election code needed just 14 words to identify the district: "Adams, Brown, Calhoun, Cass, Greene, Hancock, Jersey, Mason, McDonough, Menard, Morgan, Pike, Schuyler, Scott."

Some of this land is now located in Illinois' 17th congressional district. But the 17th is a twisted, mash-up of a district, including parts of 23 counties and the entirety of only 9. The district is contiguous in name only: several portions of the district are connected by sections less than two miles in width. A particularly odious part of the district stretches through Springfield over a park and country club measuring fewer than 1000 feet in width, and then grabs much of east Springfield, finally ending over 30 miles east in Decatur. Illinois state code requires over 2,700 words to legally demarcate the district's boundaries, most of which are lists of Census block numbers. Has this change, from a relatively centralized district made with county building blocks, to a complex, bizarre district following no recognizable pattern, influenced the relationship between residents of the 17th and their House members? This research examines the role of legislative districts in the representational relationship, with a focus on the influence of districts characteristics like the number of residents in a district and the location and shape of district boundary lines.

It should be of no surprise that students of American politics have been attracted to the intractable questions of representation. The ideas and theories that fueled the creation of the American republic also spawned some of the most contentious political debates in American history. Political scientists as well return to representation as a central concept of politics. Each election cycle brings reminders of the importance of representation, as challengers claim incumbents have neglected their representational roles and have become more self-interested politicians in the capitol. Incumbents, for their part, go to great lengths to maintain a relationship with their constituents, endeavoring to convince the district of the importance of their activities on the district's behalf (Fenno 1978).

Yet the questions of representation remain. How should we define it? How can it be measured? What marks good representation from bad? Or perhaps even more important, what influences the quality of representation produced in American democracy? Can "good" representation be incentivized by institutional design to secure that outputs correspond to the will of the people and (or?) the public good?

Much theoretical and empirical work has addresses these questions. The goal of this project is to identify another piece of the puzzle. The theme in these pages is that legislative districts, which delineate and define a legislator's geographic constituency, influence representation in important ways. Districts, their size, shape, and location of their boundaries, structure the type and quality of interaction between constituents and legislators, which has important consequences for the relationship between the representative and the represented.

1.1 Geography and Representation

Part of beauty of the American legislature is the unique role it is given in the American political system. Each individual legislator is given a special charge to represent the people and interests of his or her district in a way that no other official or institution can. Representation in America's federal system is tied inextricably to geography - representation in Congress or state legislatures is based not on political party but on geographic residence. Political power through representation in any American legislature is given based on assignment into a legislative district which covers a particular geographic area. Legislators are charged with representing the interests of their constituents - the ones who live within the geographic boundaries delineated by legislative districts.

This system of representation implicitly assumes place matters - that groups of the state or nation should come to the whole based on place, not ideology, partisanship, issue preference, age, race, gender, or any other characteristic that differentiates one group from another. It is useful to reflect on how representation in such a system differs from representation based on some other characteristic. Take, for example, a party-list proportional representation (PR) system. Here representation in the legislature is not based on geography but on partisanship. Seats are distributed to political parties in proportion to their vote share in the previous election. Representatives are responsible to those citizens who voted for their party; other citizens have other parties from which to receive representation. But legislators in the American system are charged with representing *all* constituents residing within their district's boundaries. No other representative is available to carry out duties mishandled or to listen to opinions ignored.

The point is that the American representational system places the burden of representing the will of the people not on the executive or judicial branches of government, but on the legislative branch. Representation happens in a relationship built on geography, with one legislator chosen from a district to represent the interests of the residents of that district. The entire representational system, then, is predicated on the connection between the citizens in a district and their elected representative. That is the representational relationship.

Legislative districts structure the representational relationship. In order for a constituent to contact her state representative, she must first place herself within a legislative district. Only then can she identify her representative. Likewise, candidates first locate the boundaries of their district and then send out mass mailings, run a TV commercial, or setup a district office. This point is not trivial. Districts necessarily mediate any and all interaction and communication between legislators and constituents.

Relatively little research has studied how districts influence the relationship between constituents and representatives and the resulting consequences for representation. In the U.S., redistricting is the purview of state legislatures: both congressional districts and state legislative districts are settled by state legislation (with input from the courts or the Justice Department, depending on the state). Thus districts are created by a diverse group of line-drawers across the country (McDonald 2004). This coupled with the amazing socio-political and demographic variation across states has led to a wide array of districting practices and an even larger variation in the sorts of districts drawn. I harness this variation to account for differences in the closeness of the representational relationship across districts and states.

A strong connection between representatives and their constituents is a good thing for democracy. It is good for representatives to listen closely to opinions of their constituents. It is good for constituents to inform their representative about what they want and expect from government. And it is a good thing when legislators effectively communicate the intricacies of their (and the government's) actions to the people in their districts. All of these help ensure the "objective interest" of the district is served (Pitkin 1967). If, as I suggest, districts play an important role in determining the nature of these connections, then it may be time to consider this aspect of districts during the redistricting process.

1.2 Districts as Intermediary Legislative Institutions

According to Douglass North, "Institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction. In consequence they structure incentives in human exchange, whether political, social, or economic" (1990, 3). For North, institutions can be either formal or informal. They may be organizations, laws, or even norms of behavior. What defines an institution is its function of structuring human interaction (Steinmo, Thelen, and Longstreth 1992).

Legislative districts fit this definition nicely. Districts define the playing field for elections, establishing the boundaries in which candidates campaign and citizens vote. They place a structure on legislative elections and representation in legislative assemblies by placing restrictions on who can run for legislative office (candidates usually run for legislative office in the district in which they live) and providing a person to address constituent concerns and requests. Like all institutions, districts mediate interactions between two (or more) groups or entities. But in the case of legislative districts, this

mediating function takes place between constituents and representatives, thus structuring the relationship between constituents and representatives and playing an important role in representation. Situated between the two parties, districts may influence the behavior and attitudes of both constituents and legislators. It is this between-ness of districts which provides the opportunity to influence representation. But districts are unique legislative institutions in two important ways.

First, districts not only structure interaction between representatives and their constituents, they create a new entity in the process. The drawing of district boundaries separates each group of residents, tied, as always, to a particular geographic area, from all other residents. Only those residents grouped together are allowed to be decision-makers on behalf of the district. In other words, districting necessarily involves the creation of political communities for the purpose of selecting representatives (Ostrom, Tiebout, and Warren 1961). What emerges from these institutions are new political communities with their own set of characteristics and attributes determined solely by the district itself.

Second, districts are short-lived institutions. Each district is given a life-span of 10 years. After the next decennial census, districts boundaries (usually) will be redrawn. In other words, districts are temporary political boundaries. They serve only one purpose: to group citizens together for representation in the state or federal legislature. The transient and temporary nature of districts leads to a sense of arbitrariness. Districts lines must be drawn somewhere and will likely be changed in a few election cycles.

The degree to which these factors - the designation of a political community and the transient, somewhat arbitrary nature of legislative districts - influence the representational relationship is determined by characteristics of the legislative districts

drawn. I focus on three district characteristics throughout this project: constituency size (or district population), geographical compactness of district boundaries, and the extent to which district boundaries are drawn in reference to other political boundaries. These characteristics are increasingly important in redistricting debates: reducing constituency size has been mentioned by a smattering of scholars and pundits as a possible way to improve representation in the U.S. House of Representatives and the state of California (Lijphart 1998; Yates 1992; Wiegand 2006). Geographical compactness and districting with respect to political subdivision boundaries are considered "traditional districting principles" and have been identified by the U.S. Supreme Court and redistricting reformers as potential race- and party-neutral districting criteria (Altman 1998c).

1.3 How Districts Shape Representation

Legislative districts matter because they have the distinct function of defining *who* is to be grouped together for representation. Districts create political entities – jurisdictions in which some citizens will reside and some will not. Thus districts create political communities which include and exclude based on geographical residence. Fenno (1978) writes of the legal or geographical constituency – the most encompassing view of constituency he finds among members of Congress. Representative perceptions of this constituency are dominated by the location of district lines and the demographic identity of the residents falling within those lines. Fenno argues that these considerations are primary in the representative's mind, and refers to the representative's discussion of geographical constituency as "prepolitical."

Ostrom et al. claim that "[s]pecification of the boundary or scale conditions of any political jurisdiction is important in determining the set of interests which are to be

internalized within the organization" (1961, 836). While Ostrom and colleagues are speaking about local governments, the same concepts can be applied to legislative districts. The scale and boundaries of a district (constituency size and district lines) determine the interests represented in government. This is so, the authors argue, because political boundaries define political communities, and only those within a given political community can contribute to the decision-making of that community. Constituency size and districting principles are central elements in defining the political communities that result from the redistricting process. Thus to understand how districts shape the representational relationship, it is not sufficient to study one district characteristic. Multiple characteristics of districts shape the type of community creating by the district.

Because districting inherently involves the creation of political communities, attention should be drawn to how different types of political communities may enhance or detract from representation. Two broad categories can accurately classify arguments about how districts shape representation.

1) Communication and Information Transmission. District characteristics shape the information exchange between constituents and legislators, both in degree and in type. Certain types of districts may facilitate a greater degree of face-to-face communication between constituents and representatives, which may in turn affect citizen assessments of representational quality. Also, certain types of districts may enhance the ease of which constituent-legislator communication is conducted.

2) Homogeneity. As Dahl and Tufte (1973) maintain, homogeneous populations should lead to greater responsiveness by the representative to constituent demands. Further, Fenno (1978) cites the degree of homogeneity of the district as an integral aspect

of the representative's perception of their legal or geographical constituency. According to Fenno, representatives *do* think about their home districts in terms of homogeneity or heterogeneity. Another important element that falls in this category is whether principle in question leads to districts that reinforce meaningful political units. Small constituency size, compact districts, and boundary lines drawn over city or county boundaries, I argue, lead to more meaningful political communities that share common interests, thus making responsiveness easier. For example, if district size and boundaries allow for only one major economic interest (e.g. rural districts of farmers and farming communities) in a district, then the representative should find it relatively simple to be responsive to the demands placed on him or her, particularly on voting matters. If however, a district is half rural and half urban, the legislator may feel a tension between the competing interests in the district. Decisions made, such as voting on appropriations bills, may pit one part of the district against another, and result in less satisfaction with the representation received. Districts can be homogeneous in different ways. The term can be used generally to refer to the similarity on a number of dimensions (Dahl and Tufte 1973), or it can be focused on one particular dimension.

1.4 Constituency Size

In important ways, small legislative districts are different from large ones; scale issues should influence the representational relationship (Dahl and Tufte 1973). For example, the more residents in a district, the harder it is for candidates to campaign using grassroots or door-to-door techniques. Time is too scarce a resource for candidates for legislative office to utilize that form of campaigning. Instead, candidates opt for mass media campaigns, using radio, television, or mail advertisements to get their message

across. Small districts, however, enable face-to-face and door-to-door campaigning. Larger districts generate greater legislative workload: a state senator representing 300,000 residents should, all else being equal, have more requests for constituent service than would a state senator from a neighboring state with only 30,000 residents. The scale of a district is an important determinant of the workload constraints inherent in the job of representing, and constituency size is the key operationalization of scale. Research on the determinants of legislative professionalism in the states, for example, has identified population size as a key, if not the key, determinant of the process (Mooney 1995; J. D. King 2000).

The constituency size of a district can be simply defined as the population size of the district. Since reapportionment revolution and the legal enforcement of the one person, one vote standard (*Baker v. Carr* 1962; *Reynolds v. Sims* 1964; *Wesberry v. Sanders* 1964), the constituency sizes across districts of the same legislative chamber have been approximately equal; thus, constituency size can also carry the meaning of the average district population within a legislative chamber.

Constituency size is dependent on two items: the number of seats in the legislative assembly and the population size of the polity. The only way to maintain a constant constituency size when population size is growing is to increase the number of seats in the legislature, spreading out the additional residents into more seats. Throughout the first century and a half of American history, legislatures tended to follow this pattern, particularly in the U.S. House of Representatives. However, the size of the House has not seen a lasting increase since 1912 (C. A. Kromkowski and J. A. Kromkowski 1991; Michel L. Balinski and Young 1982).

State legislatures as well, after showing great willingness to change the size of their legislative assemblies in early American history, have seen relatively few changes since the mid-20th century. The changes that have occurred have mostly been to *decrease* the number of seats in the legislature, to facilitate efficient, professionalized legislatures and to reduce legislative spending. But the population size of the United States has exploded over the last 60 years, particularly in states like California and Texas. The result? The typical American state legislator represents twice as many constituents as his counterparts did in the early 20th Century. The story in the U.S. House is even worse. The last increase in the size of the U.S. House occurred with the addition of Arizona and New Mexico to the union after the 1910 Census. Since that time, the population size of the U.S. has increased by 200 million residents, resulting in a three-fold increase in constituency size. U.S. House members, on average, represented 650,000 persons after the 2000 Census. After reapportionment and redistricting prior to the 2012 congressional elections, that number will surely jump to over 710,000. A growing constituency size is not just an interesting institutional development: it should have consequences for the relationship between U.S. legislators and their constituents.

Constituency size should influence the representational relationship through the two mechanisms of homogeneity and information transmission. Smaller districts, *ceteris paribus*, tend to be more homogeneous, and homogeneity should make representation more effective. A district with clearly defined and unified interests displays less uncertainty regarding preferred policies and expectation regarding legislator behavior. Heterogeneity of interests, on the other hand, gives opportunities for legislative shirking and ignoring interests (Jewell 1982).

Smaller districts also enable more direct communication between constituents and legislators. As constituency grows, the ability of a legislator to maintain contact with a substantial proportion of his or her district shrinks. Communication and interaction, when constituency size is large, is necessarily conducted through the intermediaries of mass media (during the campaign) and staff (during governance). Legislators simply cannot effectively listen to constituents, answer mail, knock on doors, and carry on other legislative tasks when workload from constituent demands is high.

1.5 Compactness

Geographical compactness is considered a "traditional districting principle" by the U.S. Supreme Court in a string of recent cases and has been suggested by political reformers as a party-neutral redistricting principle. As such, compactness, as a characteristic of district boundaries, is receiving a good deal of attention in legal, reform, and academic circles (see Pildes and Niemi 1993; D. D. Polsby and Popper 1993). When political observers comment on odd-looking districts in redistricting plans, they are referring to the relative lack of compactness of the proposed districts.

The guiding principle of compactness is simple: compactness is the degree to which residents who live close to one another are also grouped into the same legislative district. Complaints about gerrymanders are often sparked from a lack of compactness. Elbridge Gerry's famous 1812 districting plan that wound through portions of Suffolk and Essex counties in north Massachusetts was ridiculed for looking like a salamander for this very reason. The district did not group people who lived closed to one other in the same district; rather, it snaked north along the edge of Essex county and then east to the Atlantic. Visually, the district was not compact, it was elongated and stretched.

Compactness can be thought of as a measure of the shape of district boundaries. Circles are perfectly compact shapes, where the length of the shape's border is as short as possible given the area. A circle is thus the most compact district possible. Compactness measures punish both non-circular (elongated, finger-like, or just plan bizarre) boundaries and complex boundaries, since they add length in boundaries with little additional area covered.

Geographical compactness may influence the representational relationship for the same two reasons as constituency size: homogeneity and information transmission. Compact districts maximize one form of homogeneity: geographical homogeneity. Residents may have common interests for the simple reason that they live close to one another. In a compact district, urban residents would be grouped together with other urban residents, suburban residents with other suburban residents. Residents in the northeastern part of a state would be grouped with other northeasterners, not southwesterners. In other words, because interests are at least partial distributed geographically, a compactness principle would heighten the homogeneity of those interests within districts.

But the real motivating factor behind the use of compactness in redistricting is information transmission. Non-compact districts are said to confuse voters (and maybe even representatives!), make campaigning harder and less efficient and make it more difficult for citizens to place themselves within a district. Thus candidates and representatives should have a harder time communicating to constituents, constituents should have harder time receiving messages from their representatives and legislative

candidates, and constituents should have a more difficult time responding to and contacting their elected representatives once they reach office.

1.6 Boundary Coterminousness

A second traditional districting principle, although not nearly as frequently referenced as compactness, is districting with regard to pre-existing political subdivisions. Legislative district boundaries cover geographical space. They are necessarily drawn on existing geographic and political features: roads, farms, shorelines, counties, etc. District boundaries always cut and compartmentalize geographic area. District boundaries may, however, cut and compartmentalize in accordance with political units already in existence. In other words, district lines can follow other political boundary lines, most notably county and place boundaries; legislative district boundaries can be drawn so that they are coterminous (have the same ending point) with other boundaries. Boundary coterminousness, as a districting principle, is the extent to which district boundaries occupy the same geographic space as state, county, or city/town boundaries.

Coterminousnes is a measure of the "depth" of boundary lines. District boundaries are always somewhat arbitrary; they bear no visible markings on the landscape, change regularly, and are only used by residents every two years. District boundaries, for the average citizen, have very little meaning. But legislative districts can be drawn in such a way as to borrow "depth" from other political boundaries that citizens find recognizable. Most citizens know their county and city of residence and have some idea about the locations of those boundaries. Legislative districts drawn in accordance with such

boundaries should seem more real to constituents, rooted as they are in political units constituents can recognize.

Historically, U.S. congressional and state legislative districts had greater coterminousness in the past than they currently do. Changes in redistricting practices in the second half of the 20th Century have had a large impact on coterminousness. The reapportionment revolution, for example, established population equality as a central aspect of redistricting, made it impossible to simply use county boundaries as units of representation, with each county in a state given a seat in the state legislature (Baker 1966; G. W. Cox and Katz 2002; Ansolabehere and Snyder 2008). The use of multimember districts in congressional redistricting was also stopped. Counties (and even states) were used as the building blocks of multi-member districts, with either the congressional delegation elected at large from the state, to county-based districts with counties over a certain population size granted an extra seat. The Voting Rights Act has also played a role in the changing American district. Creating majority-minority districts can be a difficult task if minority populations are widely dispersed across a state. In such a situation, map makers in the state must be creative to ensure an appropriate number of majority minority districts within the state and meet the requirement of equal population across districts. In sum, the historical trend is decidedly away from coterminous district boundaries. Many of these changes were critical reforms aimed at securing fair elections and improving American democracy. But they also may be weakened the connection between citizen and their elected representatives.

Coterminousness, as a property of legislative districts, may influence the representational relationship through homogeneity and information transmission, as

discussed above. Similar to the hypothesized role of compactness, coterminous should have a homogenizing influence on districts. When legislative district boundaries mirror county or city lines, community interests are incorporated into legislative districting. Constituents living in the same community have a set of common interests due entirely to the fact that live in the same community. Such community interests usually entail resource allocation interests. For example, most states have some sort of rural/urban conflict in the state legislature. Rural interests differ from urban ones on many key matters of state public policy like education, transportation, and agriculture. And then there are more specialized examples of resource allocation. Which city should get the new casino? Which company expansions should be supported by the state's job growth initiatives? Should the state help fund the new stadium? Even non-allocation issues can reflect community interests. For example, support for a bill on changing automotive emissions standards will certainly vary due to partisanship and ideology but also by the importance of the automotive industry to the local economy. Many of the most important and contentious interests in politics are geographically distributed - and since substantive policy-making is done at the local level, geographic interests are inherently tied to communities. Legislative boundaries coterminous with political subdivisions create districts that share these interests, rather than districts that cut across them.

Information flow between constituents and legislators should improve under the condition of coterminous district boundaries. Coterminous boundaries result in lower information costs for citizens to find out their district of residence. If all the information needed for a resident to place herself within the districting system is to know what town she lives in or which side of the county border she resides, then the information costs are

relatively low. Non-coterminous district boundaries, however, have steep information costs: citizens may need to analyze the maps at the street level in order to be sure of the location of their home vis-à-vis the district boundary. Thus coterminous boundaries should result in greater information transmission between constituents and representatives. Because constituents can more easily identify their district, they should be more likely to identify candidates for office in their district and learn more during the campaign. Further, coterminous boundaries should make it easier for citizens to contact their elected representatives once in office.

1.7 Measurement

Using Census data and geographical information system (GIS), measures of constituency size, compactness, and coterminousness have collected measures of these three characteristics in every congressional district and state legislative district in America. These data provide an unique opportunity to examine how and if districts influence representation.

1.7.1 Measuring Representation: the Policy Congruence Model

Measuring representation is no easy challenge. Representation is a complex concept, and concretely defining what makes a "good" representative is difficult. One common approach has been to compare the ideology and policy preferences of citizens with the voting behavior of their elected representatives (Miller and Stokes 1963; Erikson 1978). This operationalization of representation models the congruency of policy choices between the representative and the represented. This method certainly has its merits: a

key aspect of democratic republic is the translation of the will of the people into public policy through elected representatives.

But the problem with studying representation solely through the lens of policy congruence is that it misses much of the job of representation. While legislators vote on bills and draft legislation, their job description also includes listening and responding to citizen requests – which may or may not be related to policy issues, visiting home district constituents and giving speeches to local organizations, and securing resources for large-scale projects in their district. In short, much, if not most, of a legislator's time and energy is spent engaging in aspects of representation that have nothing to do with substantive policy responsiveness.

Hanna Pitkin's (1967) seminal work on representation raises more questions about the representation-as-policy-congruence model. She notes the complexity inherent in the concept of representation: "But the standard by which he will be judged as a representative is whether he has promoted the objective interest of those he represents. Within the framework of his basic obligation there is room for a wide range of alternatives." This definition of representation - acting in the objective interest of the represented - is a good working definition. But what is the objective interest of the represented? How do we identify or measure it?

Further, Pitkin explicitly rejects the common Burkean delegate/trustee dichotomy. A legislator assuming the representational role of delegate acts as a slave to constituency opinion. A delegate represents by carrying out the wishes of her constituents in all instances. The trustee, on the other hand, does what he deems best, regardless of his district's preferences. Pitkin rejects both models: any legislator acting as pure delegate or

pure trustee would be seen as representing poorly. No citizen wants their representative to vote for legislation the representative believes would harm her district; likewise, no citizen wants their representative to regularly ignore the clear wishes of the people. Both roles taken to the extreme would not result in representation, according to Pitkin.

What does this mean for the policy congruence model? The model is predicated on a delegate representational role. The model measures the extent to which representatives match constituency opinion across a range of policies. The assumption inherent in the model is that a close match is evidence of good representation. Pitkin's work highlights the fact that such a model, while important, can only capture part of what it means to represent.

This point is driven home even more concretely by Eulau and Karps (1977), who identify four separate notions of responsiveness key to the overall concept of representation. To the aforementioned policy responsiveness, the authors add service responsiveness (responding to citizen requests for particular, non-public policy benefits), allocation responsiveness (securing resources for projects or entities in the district), and symbolic responsiveness (gestures undertaken by the legislator to garner support from his or her constituents). Representation, then, is a multifaceted concept. It is certainly related to the act of drafting and voting on legislation but should not be limited to it. It encompasses the entirety of the legislator's job description.

1.7.2 Measuring Representation with Survey Data

Accurate measurement of a concept this deep would require an extensive research project coupling roll call, legislator behavior, and constituency public opinion measures. This project is necessarily narrower, but the aim is still to say something about the quality

of representation produced through the representational relationship and American legislatures. To do so, I turn to over a dozen public opinion surveys spanning over a decade of American political life. These surveys offer measures of citizen evaluations and assessments of their elected representatives, legislative institutions, and government as a whole, as well as the contact and communication between respondents and representatives. The evaluations vary by type, ranging from approval ratings to political trust. Such a dataset is particularly important at the state level, where very few studies have examined evaluations of government and institutions (for a notable exception, see Kelleher and Wolak 2007). There is a general dearth of survey data about attitudes toward state government and even less data on state legislators. In order to overcome this data issue, I placed survey questions on four national public opinion surveys during 2008 and 2009 to measure the degree of citizen trust in state government, assessments of the responsiveness of the state legislature and state representatives, and communication with state legislators.

Using individual level evaluations of representatives and representative institutions has several benefits. First, citizen *perceptions* of representation should be related, to some extent, to *actual* representation. The key is that evaluations do not focus exclusively on one component of representation but force respondents to give summary judgments about representatives and representative government.

Second, such an approach incorporates citizen expectations and desires into the evaluation process. Dissatisfaction with the state legislature, for example, means that institution is not living up to the expectations of the people. Objective measures of representation, such as policy congruence, offer no baseline for evaluation. How often

must a legislator's vote be congruent with constituent preferences (assuming the constituency has a preference on the issue) for legislator to be representing his district well? Dissatisfaction, in and of itself, sends a message about the quality of representation. Further, cross-sectional variation supplies an additional element here: why are respondents from some places more satisfied with their representatives and legislative institutions than residents from other locations are? Such disparity provides an excellent avenue to research the importance of districts in representation.

Finally, public opinion surveys offer measures of communication between legislators and constituents. Communication can be considered an integral aspect of the representational relationship. Malcolm Jewell is very clear on this point:

> One of the most common demands made by constituents is that their representatives be accessible, that they stay in touch. For the legislator to find out and evaluate what his constituents are demanding, he must develop an effective system of communications. To explain to constituents what he has done, and why, he must also develop a communication system (1982, 18).

Jewell suggests communication is a key component of representation or at least a necessary prerequisite for representation. Communication, in Jewell's view, involves three aspects: 1) being accessible to constituents, 2) actively seeking out constituent needs and opinions, and 3) educating constituents about issues and his or her legislative activities. Public opinion data allows the incorporation of communication measures into the study of the representation and the representational relationship. This study of representation, then, is focused on the relationship between constituents and legislators, the strength of the connection between them, and the resulting evaluations of the representation produced from constituents' perspectives.

1.8 Analysis

Constituency size, geographical compactness, and boundary coterminousness measures at the state legislative district and congressional district levels were generated for this analysis following the 2000 Census redistricting process. The result is an entirely unique dataset which allows an examination of the influence of district characteristics on representation across levels of government. Since districting is in the purview of the states, great variation exists on all three of these district characteristics, even among congressional districts. Exploiting this variation by generating concrete measures of district characteristics makes this research project work.

With geographic identifiers included in the surveys, respondents can be matched to their state or legislative district. The three aspects of legislative districts, constituency size, compactness, and coterminousness, can then be merged with individual level survey data and modeled as potential determinants of individual attitudes, while accounting for the influence of a variety of individual and contextual factors. This approach allows the use of a wealth of public opinion data which can vary cross-sectionally as well as longitudinally, to evaluate the representational relationship. Since the data are generated at multiple levels (individual survey data and aggregate district data), multilevel models are utilized throughout this project to accurately determine the influence of district characteristics on the representational relationship.

1.9 Outline of the Dissertation

Chapter 2 develops a theory of how district scale influences the representational relationship, reviews the pertinent literature on constituency size and traces the size of American legislatures and chamber constituency sizes through American history. The

story of constituency size is one of static institutions (chamber size) in the face of dynamic population growth.

Chapter 3 argues that important changes in American districts have occurred over time, with relatively little attention paid to whether these changes affect representation. Boundary characteristics such as compactness and coterminous have seen large changes over time due to political reforms like the Voting Rights Act and court-mandated population equality. Research that has examined the influence of boundary characteristics has focused exclusively on their consequences for partisan makeup of legislatures or racial representation. A complete picture of districting in America must consider both constituency size (as determined by population growth and chamber size) and boundary characteristics.

Chapters 4 and 5 examine empirically the connection between district characteristics and representation in U.S. state legislatures. Chapter 4 focuses on state legislative constituency size and public opinion. The large variation on constituency size guarantees both very small and very large district populations. I find strong empirical evidence that constituency size structures the relationship between citizens and legislators. Citizens from states with large constituency sizes report less trust in state government, more negative opinions of state government, and lower approval ratings of the legislature. Respondents from such states also are less likely to say their state representatives are responsive and to report having met their representative. In other words, constituency size is an important determinant of representation at the state level and deserves much greater public and scholarly attention.

Chapter 5 incorporates traditional districting principles into the state-level analysis. Leveraging measures of compactness and the boundary coterminousness derived using GIS, influence of district shape and boundary lines on about representation on the state level is tested. These results are combined with the previous findings on constituency size to obtain a broad picture of the impact of districts on representation in the states. The findings show some modest support for the role of boundary characteristics – particularly coterminousness – on representation at the state level. These results are stronger for communication measures and evaluations of representatives than for broad assessments of state government or the legislature.

In chapter 6, the empirical analysis is expanded to the congressional district level. While offering the possibility to examine the key concepts' relationship to measures of overall representation, the U.S. House level also provides a particularly good opportunity to test some of the communication and linkage expectations. I find strong evidence at this level that all three district characteristics are important predictors of various as components of representation. A complete view of district characteristics must incorporate all three measures.

Districts matter for representation. They influence the degree of separation between constituents and legislators. A closer and stronger connection between elected legislators and the people who elected them can be produced by creating certain types of districts. The evidence presented here shows district characteristics like constituency size, coterminousness, and compactness have important effects on the representational relationship.

CHAPTER 2. CONSTITUENCY SIZE IN HISTORICAL PERSPECTIVE

We forget, sometimes, the past battles over representation. Reform movements sprout up over time, proposing to alleviate this or that symptom of democratic illness. And for a period, intense focus can be directed at institutions, laws, and processes. Rarely does this focus fall on the true issue at hand: the nature of representation in a republican government. Reforms often skirt the issue yet have consequences for the quality and nature of representation. More importantly, concepts of representation underlie, usually implicitly, the specific reform proposals. Yet conflict is often about representation: what it means and how it should be achieved.

American legislative institutions have undergone a series of reform movements in the past half century that have reshaped representative government, particularly in the states. The 1960s saw the final battles over reapportionment, with the Supreme Court mandating the one person, one vote standard in the states (Ansolabehere and Snyder 2008). The 1960s and 1970s witnessed the legislative professionalism movement, which sought to improve the quality of representation provided by state legislatures by providing additional resources for legislators to meet the demands of an increasingly important and complex job (Rosenthal 1981; Citizens Conference on State Legislatures 1971). And in the 1990s came the term limit movement: a push to throw out the rascals squatting in American legislatures, whose constant presence, it was thought, led to corruption and stagnation (Carey, Niemi, and Powell 2000b; Kousser 2005; Kurtz, Cain, and Niemi 2007; Bowler, Donovan, and Tolbert 1998).

These reforms have been enacted through the courts, through the traditional legislative process, and through ballot measures. The idea behind all three of these reform movements is simple: the quality of representation provided for by legislatures is lacking and something needs to be done to fix it. The treatment, of course, depended on the diagnosis. The reapportionment revolution was centered on districting, fairness, and the ultimate democratic principle of equality under the law. The American legislative system was supposed to avoid British-style "rotten boroughs," so why did rural Americans have a much stronger say in who sits in the legislature? The professionalism movement focused instead on the capacity of legislatures to meet growing demands. Here the need was for modernization. Could Americans truly expect citizens to be attracted to service in the legislature when pay was low? Could the legislature adequately address the pressing issues of the state when meeting only for two months every two years? The term limits movement responded with an opposite diagnosis: legislators, or professional politicians, *were* the problem. Representatives, it was argued, have lost touch with the desires and opinions of their home districts and have been corrupted by politics. By limiting the time spent exposed to such an influence, and by ensuring turnover in the legislative body, the quality of representation produced by state government would improve.

This projects offers a new diagnosis: the quality of representation provided by lawmakers and realized by constituents is at least partially determined by the legislative districts drawn. Due to a myriad of changes over time in American politics, many current legislative districts obfuscate what should be the clearest and closest relationship in a territory-based democratic republic: the relationship between citizens and their elected

representatives, particularly the representatives serving in the lower chamber of the legislature. Such a diagnosis focuses attention on how the principles used to draw district boundaries might structure the relationship between the representative and his or her constituents. Characteristics of districts reward and constrain certain types of both representative behavior and legislator/constituent interaction. Using public opinion data on citizen attitudes toward government, legislative bodies, and legislators themselves, and matched with information on district characteristics, this research analyzes the extent to which certain district characteristics structure the way citizens and legislators interact and to what degree such characteristics impact public opinion on various elements of representative democracy.

2.1 Historical Development of Constituency Size

Debates concerning the appropriate size of legislative districts in America are as old as the nation itself. A significant point of contention during the debate over the ratification of the U.S. Constitution between Federalists and Anti-Federalists was the proposed population of House districts and the corresponding size of the U.S. House of Representatives. The Anti-Federalist authors were particularly concerned with the capability of the House of Representatives to adequately meet the demands of a diverse citizenry. Not only would the House not be representative of the population, its small size (at the time of formation, roughly 1 representative for every 50,000 citizens) would guarantee that only elites in each state could serve in the body. The connection between representatives and citizens in such a situation, argued the Anti-Federalists, would be weak, and lawmakers would not be seen as coming from the broader society and working on its behalf. "Brutus" put the trouble with the proposed House this way:

> The people of this state will have very little acquaintance with those who may be chosen to represent them. . . . . They will consist of men whose names they have never heard, and whose talents and regard for the public good they are total strangers to; and they will have no persons so immediately of their choice so near them, of their neighbors and of their own rank in life, that they can feel themselves secure in trusting their interests in their hands. . . . [B]eing so far removed from the people, their station will be elevated and important, and they will be considered as ambitious and designing. They will not be viewed by the people as a part of themselves, but as a body distinct from them, and having separate interests to pursue.
>
> (Brutus, *The Anti-Federalist Papers*, No. 4).

Similarly, the "Federal Farmer" proclaimed the "full and equal representation of the people in the legislature" - which requires the legislature possess "the same interests, feelings, opinions, and views the people themselves would were they all assembled" including representation of "every order of men in the community" - to be essential to a free government (*The Anti-Federalist Papers*, No. 2). Representation, defined in this way, demands a large legislative assembly, with small electoral districts, so diverse elements of the population have the ability to elect a representative like themselves, not just the social and political elite. Thus the Anti-Federalists made descriptive representation a key component of their arguments about the size of the House.[1]

While Anti-Federalists were concerned with the ability of the small House to reflect the society at large, the Federalists were more concerned with creating a deliberative body to manage the clashing of interests in the large republic and perform its policy-making responsibilities in an efficient manner (Frederick 2008). According to

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[1] At the time of nations founding, descriptive representation, in the way the term is used today, was non-existent. With slavery and disenfranchisement of women, blacks, and non-landing owning white males, descriptive representation was impossible. I use the term here to refer to the idea that true representation exists when characteristics of individuals in the population elect legislators into the legislature who have the same characteristic.

Madison, more representatives do not necessarily lead to better decisions in the legislature:

> Sixty or seventy men, may be more properly trusted with a given degree of power than six or seven. But it does not follow, that six or seven hundred would be proportionally a better depository. And if we carry on the supposition to six or seven thousand, the whole reasoning ought to be reversed… In all very numerous assemblies, of whatever characters composed, passion never fails to wrest the scepter from reason. Had every Athenian citizen been a Socrates; every Athenian assembly would still have been a mob.
>
> (Madison, *The Federalist Papers*, No. 55).

Given the skepticism regarding the relationship between the number of representatives and the quality of legislative decisions, Madison responds surprisingly to the rest of the Anti-Federalist critique of the House size. Madison tries to calm fears about the small number of legislators in the first Congress by suggesting incremental increases of the number of representatives in accordance with growing population will be enough to maintain a strong connection between representative and citizens and keep representatives responsible to citizen desires. Madison clearly expected the U.S. House to grow in size in accordance with population growth to match a 1:30,000 representative to citizen minimum ratio specified in the Constitution: in *The Federalist Papers* No. 55, he estimates the U.S. House will grow to the size of 400 by 1838, explicitly assuming Congress will add new seats to maintain the 1:30,000 ratio.

Both Federalists and Anti-Federalists operated under the assumption that a sufficient number of representatives was needed for quality representation. While Anti-Federalists surely stressed this point more, Federalists believed the system set up by the Constitution would result in repeated, decennial increases in House size due to increases in the nation's population as recorded by the census. Even George Washington, who took it as his duty not to interfere with the debates during the Constitutional Convention,

weighed in on this issue, supporting a proposal that would lower the minimum number of citizens per House district from 40,000 to 30,000 – a proposal that would be adopted. In short, the men who crafted the Constitution recognized constituency size, at the very least, as an important aspect of representation worthy of debate.

History has not followed Madison's expectations. Originally created with 65 seats, the House was promptly increased to 105 after the first Census and corresponding apportionment battle in Congress. The House originally did grow in response to a growing population and the creation of new states and reached the size of 234 after the 1850 Census. But not since the addition of Arizona and New Mexico to the Union in 1912 resulted in 435 House seats has the size of the House of Representatives been increased (C. A. Kromkowski and J. A. Kromkowski 1991).

Political expediency, not careful reasoning, resulted in the freezing of House to 435 members. Congress could not reach an agreement after the 1920 Census on an apportionment bill. Kromkowski and Kromkowski (1991) place the failure of reapportionment on growing urbanism and ethnic minority populations. Nativist concerns made their way into the congressional debate, resulting in a block of reapportionment efforts. In 1929, a compromise bill was passed that froze the size of the House to 435 and automated the apportionment process after every Census. Members of Congress were divided over the bill between those who were concerned over the strains of an increased workload and those arguing the House was already undisciplined, unwieldy, and too large for adequate debate on most issues. Some members supportive of increasing the size of the House voted for the reapportionment plan to end the gridlock that was leading to under-representation of the fastest growing states (Yates 1992).

The compromise resulted in a stagnant House whose apportionment would no longer take into account an ever-increasing population . Sen. Vandenberg (R-MI) and his colleagues passed the Reapportionment Act of 1929, which required the automatic apportionment of the current House seats according to the method of apportionment used in the previous apportionment act if Congress failed to apportion the seats itself. Changed only slightly after the 1940 Census to maximize Democratic seat total in the House, this legislation essentially governs reapportionment today (M. L Balinski and Young 2001).Congress has considered increasing the size of the House in 1961 and again in 2007(Yates 1992; Frederick 2007); the most recent attempt would have added seats to be allocated to the District of Columbia but was killed by a Senate filibuster.

Figure 2.1 plots the size of the U.S. House against the apportionment population of the country. The figure shows the relationship between population growth and decennial increase in the number of seats in the House prior to 1920: as the population grew, so did the House. The freezing of the House, however, took place right as the nation's population exploded, resulting in a rapidly increase constituency size.

Institutional change is difficult, particularly change that reduces the visibility and power of members of Congress. Politicians usually seek to increase their power and influence over policy. Further, those winning elections are unsupportive of making changes to the electoral system through which they gained office (Bowler, Donovan and Karp 2002; Tolbert, Donovan and Cain 2008). It should come as no surprise, then, that members of Congress have opted to increase staffers and rely on technological advancements to maintain contact with their constituents rather than to alter their district's boundaries and create districts with smaller populations (Yates 1992). Similar

incentives may have led members of Congress to oppose term limits in 1994 (Kousser 2005). Such reforms reduce the power and visibility of most legislators and could reduce the probability of reelection, depending on where the new districts lines would be drawn (Desposato and Petrocik 2003; Crespin 2005).

It is important to note that in any given point in time, congressional districts vary in constituency size across the states. The average constituency size in the House is currently over 650,000 persons per representative and each state is mandated to have congressional districts with equal populations, but the districts are apportioned to the states according to their population. The Constitution requires each state to be awarded at least one seat in the House. Further, there is no exact way to apportion a whole number of legislators into the correct proportion of seats each state deserves. The result is a system that contains a surprising amount of "interstate malapportionment." In 2000, the difference between the largest (Montana, with over 900,000 residents) and smallest (Wyoming, with under 500,000 residents) constituency size for congressional districts was 410,000 individuals (Ladewig and Jasinski 2008).

2.2 Constituency Size and State Legislatures

The House of Representatives is not the only American legislature to deal with constituency size and legislature size debates. The debate concerning the size of the U.S. House arose, in part, from the varying answers to the same question in the thirteen original states. Madison writes that regarding the proper size of a legislature, "no political problem is less susceptible of a precise solution…" and "[n]or is there any point on which the policy of the several states is more at variance" (*The Federalist Papers*, No. 55). Even at the nation's founding, population size and legislative chamber size varied

widely across the states, as Table 1 shows clearly. Lower chamber size at the time of the American Revolution ranged a low of 21 in Delaware to hundreds of members in New Hampshire and Massachusetts; similarly, state population was also widely dispersed across the thirteen colonies. From the nation's formation, the states have displayed a penchant for different answers to the basic questions of representation in a republican form of government, like the proper size of legislative chambers and the optimal population size of legislative districts.

The American states are defined by social and political variety. Population size is no different. Since the nation's formation, to say population growth has been unequal is to understate the fact. In 1900, the population of states ranged from 42,000 in Nevada to over 7 million in New York. The standard deviation of state population size in 1900 was roughly 1.5 million. By 1950, the disparity between populous and not populous states was larger, with a range from 160,000 persons living in Nevada to almost 15 million residents in New York. Along with the range, the standard deviation also was larger in 1950, doubling the 1900 total to over 3 million persons. Fifty years later, California was the largest state with a population size of just under 34 million residents in 2000; Wyoming was the smallest with fewer than 500,000. The corresponding standard deviation of population in 2000 was over 5.6 million persons. These examples illustrate large variation in state population over time and across the U.S.

Just as large differences exist between states in population size, legislative chamber size also varies greatly across the states. In 2000, lower chamber sizes ranged from 40 seats in Alaska to 400 in New Hampshire. Interestingly, both states are among

the 10 least populous states. Upper chambers show less variability, ranging from 20 in Alaska to 67 in Minnesota.

Over-time trends are more revealing. Figure 2.2 displays the size of each state's lower chamber from 1875-2006. Several factors are evident in the figure. First, the states, as on other measures, vary greatly in how frequently they have altered their chamber size. Some states, particularly New England states like Massachusetts and New Hampshire, have made numerous alterations to chamber size, due to their historical attachment to community-based representation in the legislature (Zagarri 1987). Other states, such as Hawaii, California, and Indiana have made few or no changes to their lower chambers.

Second, state legislatures appear to grow during the 1875 – 1950 period. But few legislatures saw increases after the 1950s. In fact, Figure 2.2 suggests a declining number of lawmakers in the post 1950 period. The average lower chamber size first increases and then decreases over this time period: from 114 in 1900 to 120.7 in 1950 and down to 111 in 2000. Finally, states were much more likely to change the size of their lower chambers before 1950 than they were after mid-century. The pattern in Figure 2.2 is startling. Between 1980 and 2000, only seven states have altered the number of seats in their lower chamber.

These final two observations are expressed more concretely in Table 2.2, which presents the total number of state legislatures (in both upper and lower chambers) in the U.S. from 1875 to 2000. In 2000, there were 124 *fewer* state legislators than there were in 1925. During that same period, the population of the United States grew by 250%, or about 167 million persons. Thus the fate of American state legislatures is similar to that

of the House of Representatives: stagnant chamber sizes (or, in the case of some states, shrinking chambers) overlaid by dramatic population growth.

These trends can be combined into one conceptually appealing measure: legislative constituency size. The concept is a simple function of population and chamber size: the population of a polity divided by some measure of chamber size (be it the lower, the upper, or some combination of both chambers like the total or average number of legislators) equals the nation or state's constituency size. With stagnant chamber sizes and large population growth, constituency size must also rise.

Figure 2.3 displays the constituency size of the lower and upper chamber in all 50 states in 2000. As should be no surprise by now, very large variation exists across the states. California dominates this figure, with a lower chamber constituency size of over 423,000 residents. California state senators represent more persons than U.S. House members do, with a constituency size of 847,000. On the other extreme is New Hampshire and North Dakota. Legislators in New Hampshire's General Assembly have only, on average, 3,000 residents to represent. Lawmakers in North Dakota's upper chamber face only the representational duties associated with 13,000 residents.

Population, number of seats in the lower chamber, and the resulting constituency size scores for the years of 1950, 1975, and 2000 are given for 49 states (Nebraska's unicameral legislature excluded) and is presented in Table 2.3. The total changes on all three measures from 1950 to 2000 for the states are also included in the table. Population growth, without adjustment in the legislature, has resulted in dramatic increases in the number of citizens represented by each legislator. California, for example, has seen an increase of over 290,000 persons per district since 1950. Large states are not the only

states to display evidence of burgeoning district populations. Nevada's constituency size has grown over 1200% in the same 50-year period, for an increase of over 43,000 persons per district. Many states have simply not updated their legislative institutions to accommodate population growth.

It should by now be clear the American states offer a great diversity in the representational situation, based on constituency size, facing state lawmakers. Few empirical studies have examined if this great diversity affects the representational relationship between legislator and constituents, and how it might do so, despite calls for just that type of research (Squire and Hamm 2005).

2.3 Consequences for the Representational Relationship

Past work on district population have identified ways in which constituency size may impact both the linkage between constituents and representatives and characteristics of districts that make representation easier. A close reading of the Anti-Federalist and Federalist writings cited earlier show linkage concerns were central to the debate over ratification. The quote by "Brutus" presented above shows concern for the ability of representatives to communicate effectively with citizens when constituency size is large. Indeed, a large constituency size, according to the Anti-Federalists, would make it impossible for any significant proportion of citizens to know their representative. Further, says Brutus, they will have little information on which to judge the character of the representative. This lack of knowledge results in a public skeptical of their own representatives.

Dahl and Tufte (1973), in their seminal work, *Size and Democracy*, argue a similar, albeit more formalized relationship between population size and communication.

They purport that in small political units "[a]n ordinary citizen can deal directly with a top leader if he chooses to do so" and "[l]eaders gain their information about citizens' wants by direct observation and communication" (1973, 87) In large political units, such interaction is not possible for most citizens. Rosenthal relates constituency size to communication during the campaign: in very small districts, "each politician can have face-to-face contact with practically every voter and every constituent… In such places campaigns are door-to-door and inexpensive to conduct." In large districts, however, "there is no way to maintain direct contact with more than a small proportion of voters and constituents. In such places the conduct of campaigns, by means of mass mailings, radio, and television, tends to be costly" (1981, 14).

Do larger constituency sizes lead to less representative-constituent communication? The literature on this point agrees with the Anti-Federalists. Squire (1993) finds evidence that smaller constituency sizes lead residents of 7 Midwestern states to report having contacted their state legislator, although residents from states with smaller constituency size do not report paying more attention to the legislature. Several studies on the Senate emphasize the communication difference between senators and their constituents in small versus large states. Lee and Oppenheimer (1999), in perhaps the most comprehensive examination of how constituency size changes the incentives facing lawmakers regarding representation, provide evidence that respondents from small states report greater contact with senators than do respondents from large states. Even further, they find senators from small states believe their constituents expect more frequent contact with them than citizen from large states do with their senators. Oppenheimer (1996), sees a two-way effect for the representational relationship between

senators and constituents: constituents are more likely to report being contacted by senators from small states *and* more likely to report contacting their senators. In other words, senate constituency size influences the linkage between representative and represented, with those from small states seeking and receiving greater contact. Hibbing and Alford (1990) also find higher contact between senators and constituents from small states and that citizens in small states are somewhat more likely to recall the name of their senator. Fredrick (2007), in a recent article studying the influence of constituency size on representation in the U.S. House using ANES data from 1980 and 1990, shows as constituency size increases, contact between House member and respondents, the likelihood of the respondent initiating the contact, and the perception of how well the House member stays in touch all decrease.

Communication issues provide the motivation for Taagepera's cubed root law of assembly sizes (Taagepera 1972; Taagepera and Shugart 1989). Minimizing the combined total of communication channels from constituents and fellow legislatures, Taagepera and Shugart suggest, will lead to ideal legislature sizes that equal the cubed root of the adult population. Their comparative evidence shows much cross-national support for their model, emphasizing the role linkage demands place upon legislators. All in all, there is ample evidence in the literature to conclude (1) increasing constituency size places more communication demands on legislators; and (2) larger constituency sizes result in less contact between constituents and representatives. Rosenthal's work lends support to the idea that constituency size changes legislator behavior as well. In a survey of state legislators in five states, Rosenthal repeatedly notes the differences between opinions and behavior of Ohio legislators (with constituency sizes of over 100,000) and

Vermont legislators (approx. 4000). The Ohio legislators had greater requests for help and constituent service, were more likely to rate organized interest groups, the media, lobbyists, and legislative staff as important sources of information on the views of their constituents, and were more likely to report voting their own opinion rather than the constituency's) than were the Vermont legislators (2004).[2]

Just as there is reason to suspect constituency size to impact the communication linkage between representatives and the represented, so too is there theoretical and empirical work supportive of the notion that constituency size may influence district characteristics that lend themselves to accurate or inaccurate representation. In other words, there is reason to expect that smaller districts are easier to represent and are likely to lead to greater congruence between the legislator and his or her constituency.

Most observers speculate that smaller districts lead to more homogeneous districts (e.g. Rosenthal 1981, 2004). Dahl and Tufte (1973) argue the fewer the number of citizens in a political unit, the more homogeneous that unit is likely to be. Specifically, the authors say such homogeneity refers to social characteristics like occupation, education, and income. Dahl and Tufte put it this way: "The greater the number of constituents a representative has, the greater is likely to be the divergence in policies between representatives and constituents" (1973, 85). Thus, smaller constituencies should increase the chance that the legislator is similar to his or her constituents, reinforcing the Anti-Federalist claim that a small House of Representatives will result in the inability of "middling classes" to elect representatives similar to them. To my

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[2] Rosenthal surveyed legislators in five states: Maryland, Minnesota, Washington, Ohio, and Vermont.

knowledge only two studies have put to test the connection between homogeneity and constituency size directly. Anckar (1999) compares attitudinal and ethnic heterogeneity across island microstates. He finds less populous microstates to indeed be more attitudinally homogeneous than more populous microstates, although the finding does not extend to ethnic heterogeneity. Hibbing and Alford (1990) find mostly null relationships between Senate constituency sizes and the standard deviations of 20 attitudinal measures from the 1988 Senate National Election Study.

State legislative districts offer an excellent opportunity to test the relationship between constituency size and homogeneity. Are smaller districts more homogeneous, holding constant the demographic nature of the state? Twelve states currently require nested legislative districts, where upper chamber districts are divided in half to create lower chamber districts. Such an institutional arrangement holds constant the demographic nature of the population, providing an opportunity to compare levels of heterogeneity across chambers in the legislature. Using Census Bureau data on demographic characteristics of state legislative districts, the standard deviation of a number of sociodemographic variables were calculated across lower and upper chamber districts. These results are presented in Table 2.4 for three states – Iowa, Illinois, and Oregon – who require nesting of legislative districts and do not allow multimember districts. In all three states and across every demographic category, the standard deviation of lower chamber districts is higher than the standard deviation of the demographic variable in upper chamber districts. Lower chamber districts, for these three states, are half of the size of their upper chamber counterparts. The larger upper chamber districts makes all districts look more like each other because the large districts reflect the

population averages of the state. In other words, larger districts lump more constituents together, increasing heterogeneity within districts and homogeneity across districts. Lower chamber districts, are by definition smaller, and thus allow district averages to vary along with the residential patterns of the state.

The work of Charles Tiebout and Ostrom et al. (1961) suggest a slightly different mechanism. Both articles focus on the diversity of municipalities in modern metropolitan America. The authors argue for efficiency gains in such a system, since each municipality can tailor services to meet the desires and needs of its own political community. Likewise, constituents, argues Tiebout (1956), can move to municipalities that boast the services desired. These theories are relatable to the question at hand. Smaller district populations mean more freedom for representatives to tailor policy positions, pork-barrel projects, or votes in the legislature toward the particular desires and needs of his or her constituency. Since smaller districts are, on average, more homogeneous, legislators can please a greater number of constituents by tailoring behavior to meet more unified expectations. Larger districts impose representational difficulties: heterogeneity leads to more dissatisfaction with any given vote or policy position, and heterogeneity increases the possibility of legislative shirking, since constituents have varied interests to be represented (Jewell 1982).

All of these assorted arguments specify the same underlying relationship between constituency size and representation: smaller constituency size leads to better representation, be it from enhanced communication, or more policy congruence between constituents and representative due to homogeneous interests in the district. Previous research, mostly centered on Congress, has examined the relationship between

constituency size and citizens evaluations of government. Constituency size has been shown to be negatively related to opinions about senators (Lee and Oppenheimer 1999; Hibbing and Alford 1990) and members of Congress (Fredrick 2008), but not state legislators (Squire 1993, although Squire uses only respondents from seven states).

2.4 Operationalization and Measurement

Of the three district characteristics studied here, constituency size is both the easiest to operationalize and presents the least difficulty in data collection. Still, choices must be made regarding exact specification of the concept. First, constituency size at the state level is measured here as the average constituency size across a state's districts, rather than a property of individual districts. The reason for this is practical: accurate population data by state is available from the Census Bureau, with estimates updated periodically during each decade. District population data, however, is much more difficult to come by, and is only available during the Census year. Further, and more importantly, strict population equality standards instituted by the courts have forced states to make district populations approximately equal in size for a legislative chamber (although greater variation is allowed in state legislative district plans than in congressional district plans).

Constituency size is the population size of a state divided by the number of seats in the legislative chamber. Throughout this project, the number of seats in the *lower chamber* is used for state-level analyses. I use lower chamber size for two reasons. First, lower chambers boast greater variance in size than upper chambers. The standard deviation of lower chamber seat size in 2008 was over 56 seats, while the s.d. of upper chambers was 10.5. This makes an important difference when combined with population

data: using lower chamber size helps differentiate constituency size from raw population. The second reason is theoretical: lower chambers play an important role in the bicameral system as the legislative chamber designed to be closest to the people. Thus smaller districts coupled with frequent elections should lead to a greater transfer of popular will into the legislature, while upper chambers, like the U.S. Senate, were designed to be more deliberative bodies with larger constituencies. It makes sense, then, to turn to lower chambers for evidence of districts' influences on the representational relationship.

Calculation of U.S. House district constituency size differs slightly. The Census Bureau now provides estimates of congressional district population size between decennial censuses through the American Community Survey (ACS). The data analysis in Chapter 6 using congressional district data, then, uses estimates of the actual district population from the ACS, allowing the constituency size measure to reflect changes in district population within a decade.

In summary, both social and institutional changes have influenced American districts. In many ways, the legislative districts drawn today differ significantly from those drawn 50 years ago. This chapter established that they are much, much larger. Because the U.S., both at the federal and state levels, has been reluctant to increase the size of its 100 population-based legislative chambers in the face of stark population growth, legislators today represent many more constituents than did their predecessors. The consequences of such a shift should matter: larger constituency sizes means less direct communication between legislators and constituents and heterogeneous districts. Both items should also lead to a weaker connection between legislators and constituents

and more negative evaluations of the representation received from democratic government. These expectations are tested using survey data in Chapter 4.

Table 2.1. Population and Number of Legislators by Chamber in Original 13 States

State	1790 Population (in thousands)	Size of Chamber at American Revolution	
		Lower Chamber	Upper Chamber
Connecticut[b]	238	Variable	12[c]
Delaware	59	21	9
Georgia[a]	83	90	--
Maryland	320	80	15
Massachusetts[b]	475	Variable	40
New Hampshire[b]	142	Variable	12
New Jersey	184	39	13
New York	340	70	24
North Carolina	394	70	32
Pennsylvania[a]	434	78	--
Rhode Island	69	68[c]	10[c]
South Carolina[d]	249	199	30
Virginia	821	126	24

Note: Population data from U.S. Census Bureau, *United States Summary: 2000, Population and House Unit Counts, Part I*. Issued April 2004. Chamber size data, unless noted, are from Squire and Hamm 2005, 22-25.

[a] Both Georgia and Pennsylvania had unicameral legislatures at the time of the Revolution.

[b] CT, MA, and NH allocated seats according to cities and towns. As the number of towns choosing to fund its representative(s) changed, so did the chamber size.

[c] Source: Dubin 2007.

[d] The South Carolina constitution of 1778, rather than that of 1776, is used for these totals.

Table 2.2. Total Number of State Legislators and U.S. Population, 1875-2000.

Year	1875	1900	1925	1950	1960	1970	1980	1990	2000
U.S. Population (millions)	44	76	114	150	179	203	226	248	281
Number of State Legislators	5678	6694	7548	7493	7766	7603	7481	7461	7424

Table 2.3. Population, Lower Chamber Size, and Constituency Size in the States, 1950-2000

	Population (in millions)			Seats in Lower Chamber			Constituency Size (in thousands)		
State	1950	2000	Δ	1950	2000	Δ	1950	2000	Δ
AL	3.062	4.447	+1.385	106	105	-1	28.89	42.35	+13.47
AK	0.129	0.627	+.498		40			15.68	+6.90
AZ	0.75	5.131	+4.381	71	60	-11	10.56	85.52	+74.95
AR	1.91	2.673	+.763	100	100		19.10	26.73	+7.63
CA	10.59	33.87	+23.286	80	80		132.33	423.40	+291.08
CO	1.325	4.301	+2.976	65	65		20.38	66.17	+45.78
CT	2.007	3.406	+1.399	277	151	-126	7.25	22.56	+15.31
DE	0.318	0.784	+.466	35	41	+6	9.09	19.12	+10.04
FL	2.771	15.98	+13.211	95	120	+35	29.17	133.18	+104.01
GA	3.445	8.186	+4.741	205	180	-25	16.80	45.48	+28.67
HI	0.5	1.212	+.712		51			23.76	+6.75
ID	0.589	1.294	+.705	59	70	+11	9.98	18.49	+8.50
IL	8.712	12.42	+3.707	153	118	-35	56.94	105.25	+48.30
ID	3.934	6.08	+2.146	100	100		39.34	60.80	+21.46
IA	2.621	2.926	+.305	108	100	-8	24.27	29.26	+4.99
KS	1.905	2.688	+.783	125	125		15.24	21.50	+6.26
KY	2.945	4.042	+1.097	100	100		29.45	40.42	+10.97
LA	2.684	4.469	+1.785	101	105	+4	26.57	42.56	+15.99
ME	0.914	1.275	+.361	151	151		6.05	8.44	+2.39
MD	2.343	5.296	+2.953	123	141	+18	19.05	37.56	+18.51
MA	4.691	6.349	+1.658	240	160	-80	19.55	39.68	+20.14
MI	6.372	9.938	+3.566	100	110	+10	63.72	90.35	+26.63
MN	2.982	4.919	+1.937	130	134	+4	22.94	36.71	+13.77
MS	2.179	2.845	+.666	140	122	-18	15.56	23.32	+7.76
MO	3.955	5.596	+1.641	154	163	+9	25.68	34.33	+8.65
MT	0.591	0.902	+.311	90	100	+10	6.57	9.02	+2.45
NV	0.16	1.998	+1.838	43	42	-1	3.72	47.57	+43.85
NH	0.533	1.236	+.703	399	400	+1	1.34	3.09	+1.75
NJ	4.835	8.414	+3.579	60	80	+20	80.58	105.18	+24.59
NM	0.681	1.819	+1.138	55	70	+15	12.38	25.99	+13.60
NY	14.83	18.98	+4.146	150	150		98.87	126.51	+27.64
NC	4.062	8.049	+3.987	120	120		33.85	67.08	+33.23
ND	0.62	0.642	+.022	112	98	-14	5.54	6.55	+1.02
OH	7.947	11.35	+3.406	135	99	-36	58.87	114.68	+55.81
OK	2.233	3.451	+1.218	118	101	-17	18.92	34.17	+15.24
OR	1.521	3.421	+1.9	60	60		25.35	57.02	+31.67
PA	10.50	12.28	+1.783	208	203	-5	50.47	60.50	+10.03
RI	0.192	1.048	+.856	100	100		1.92	10.48	+8.56

Table 2.3 Continued.

SC	2.117	4.012	+1.895	124	124		17.07	32.35	+15.28
SD	0.653	0.755	+.102	75	70	-5	8.71	10.79	+2.08
TN	3.292	5.689	+2.397	99	99		33.25	57.46	+24.21
TX	7.711	20.85	+13.141	150	150		51.41	139.01	+87.61
UT	0.689	2.233	+1.544	60	75	+15	11.48	29.77	+18.29
VT	0.378	0.609	+.231	246	150	-96	1.54	4.06	+2.52
VA	3.319	7.079	+3.76	100	100		33.19	70.79	+37.60
WA	2.379	5.894	+3.515	99	98	-1	24.03	60.14	+36.11
WV	2.006	1.808	-.198	94	100	+6	21.34	18.08	-3.26
WI	3.435	5.364	+1.929	100	99	-1	34.35	54.18	+19.83
WY	0.291	0.494	+.203	56	60	+4	5.20	8.23	+3.04

Δ signifies change from 1950 to 2000.

Source: Dubin (2007) for chamber size data; U.S. Census Bureau for population estimates.

Table 2.4. Standard Deviation of Demographic Characteristics, Upper and Lower Chambers of Three States

	Iowa		Illinois		Oregon	
	Senate	House	Senate	House	Senate	House
Pct. White	.066	.073	.260	.271	.080	.086
Pct. Black	.032	.037	.209	.217	.036	.041
Pct. Asian	.013	.015	.036	.040	.026	.028
Pct. Latino	.026	.030	.166	.171	.052	.062
Pct. Urban	.442	.456	.347	.359	.407	.441
Pct. HS Gradate	.043	.048	.090	.096	.045	.053
Pct. College Graduate	.109	.117	.128	.140	.102	.119
Pct. Same House	.075	.087	.062	.072	.051	.059
Median Income	6340	7432	14867	15668	7679	8339
Number of Districts	50	100	59	118	30	60

Note: Items in cells are standard deviations of district demographic data across the chamber's districts. Data come from Census 2000 SF3 file, recalculated to match post-2000 redistricting legislative districts.

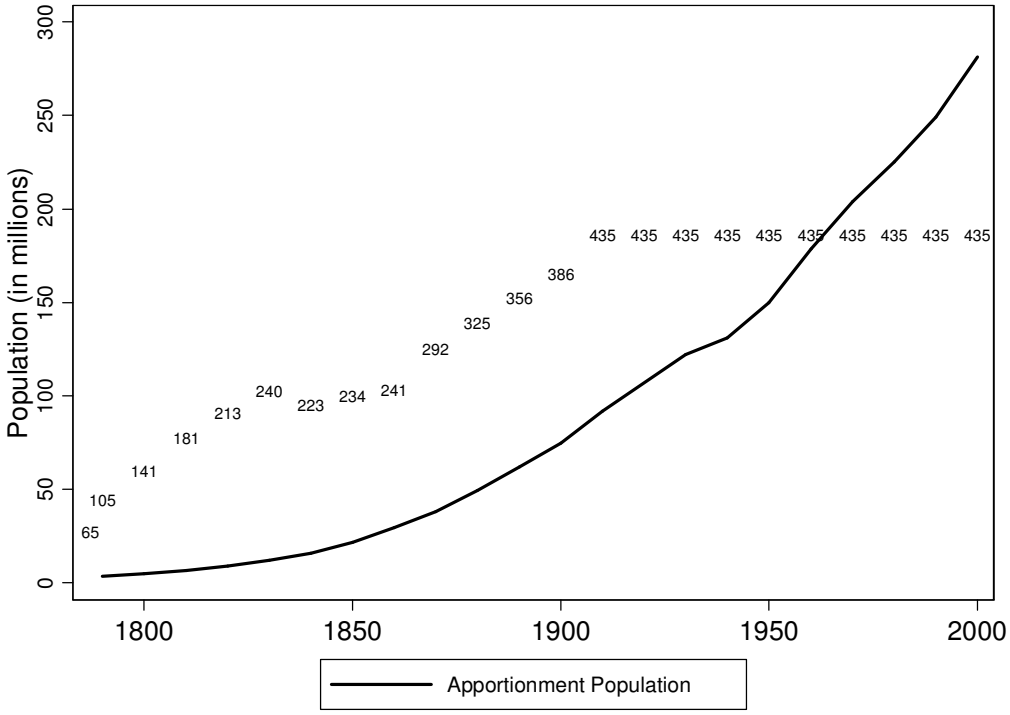

Figure 2.1. U.S. Apportionment Population and Size of the House of Representatives, 1790-2000

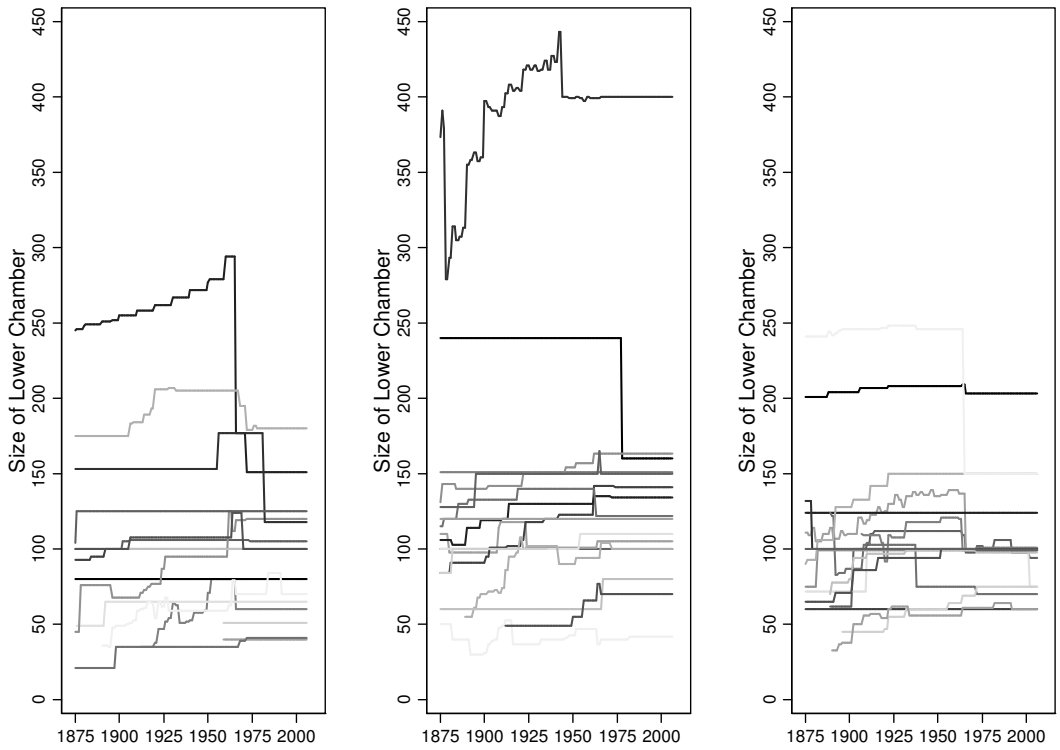

Figure 2.2. Changes in the Number of Seats in Lower Chambers, U.S. States, 1875-2000

Note: There is no significance in the breakdown between the three graph areas. States were split by alphabetical order and were done so only to make it easier to see individual state lines.

Source: Dubin 2007.

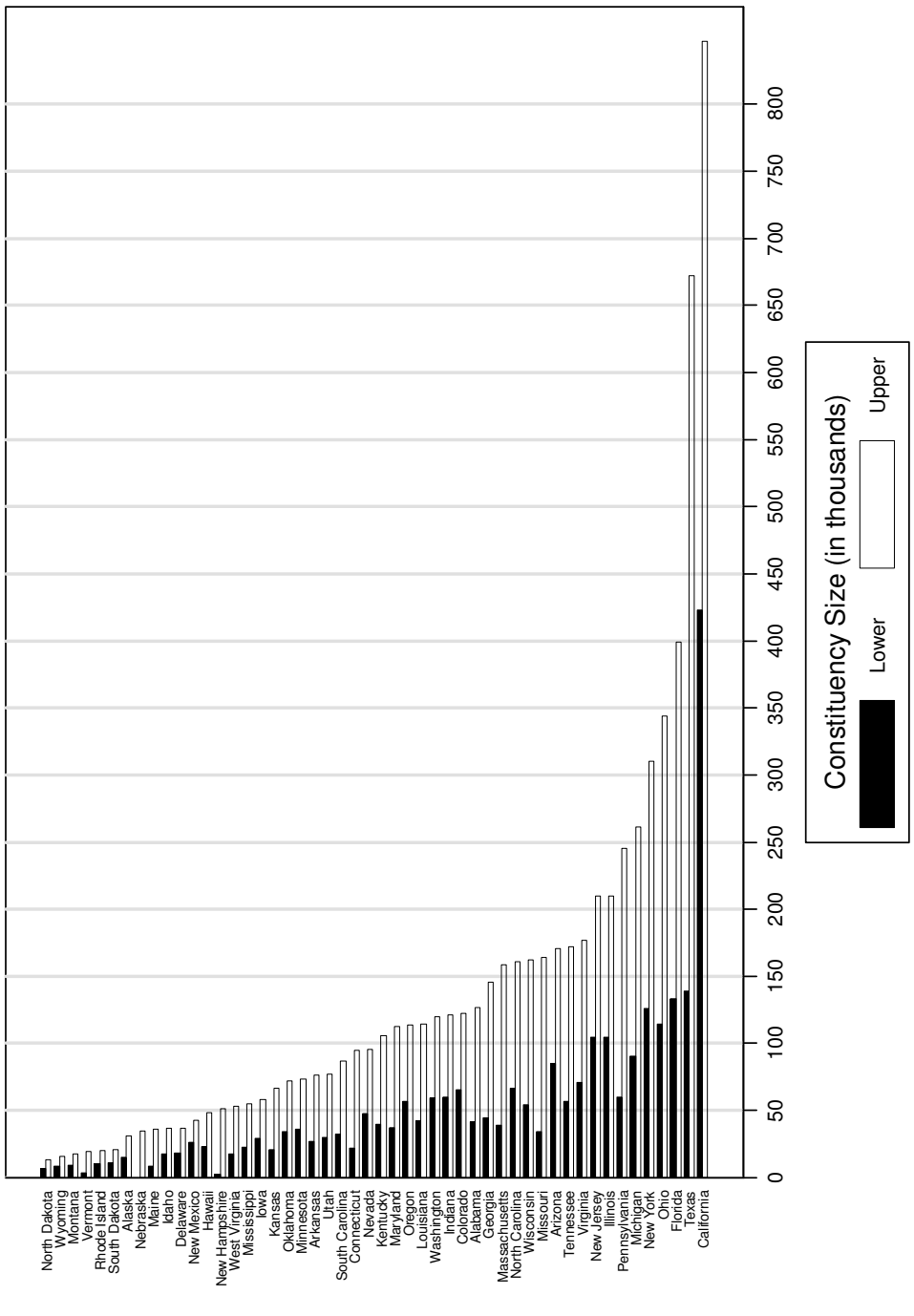

Figure 2.3. Lower and Upper Chamber Constituency Sizes by State, 2000

CHAPTER 3. DEFINING DISTRICTS: THE SHIFTING ROLE OF GEOGRAPHICAL DISTRICTING PRINCIPLES

The Constitution was silent on matters of districting. As in the case of the size of the House of Representatives, the American Founders simply did not delineate how House seats were to be assigned, let alone how districts were to be created and managed in the states. These issues were left up to the state legislatures, who were given great authority in representational issues.

There was great variety of districting practices at the nation's founding. Zagarri (1987) suggests these differences result from competing conceptions of representation. The original colonies, established under British rule, adopted the British view of representation, where seats were apportioned to communities - counties or towns. The British system viewed representation to be a communal property; membership (through geographical residence) in a political unit was the basis on which any citizen had a claim to representation. Ansolabehere and Snyder (2008) detail the reasoning behind this concept of representation for the colonies by pointing out that towns and counties had great authority in early American history: they provided virtually all of the services available including conducting elections, managing transportation infrastructure, tax collection, and education. Local leadership was elected by eligible voters and then expressed local preferences to the colonial government. Further:

> Legal and philosophical justification for representation of towns derived from the fact that towns themselves created many of the colonies. The social compacts of many colonies were agreements among towns... Consent from among the towns, then, gave flesh to the philosophical notion of the day that government arose out of a social compact. The towns created the colonies, and the colonial government granted the towns political voice. (p. 43).

A new idea arose in the colonies of New York and Massachusetts: representation of population rather than of community. At the founding the United States, both concepts were viable options for state governments to adopt, and both concepts remained ingrained in American state constitutions through the nineteenth century and well into the twentieth. For example, 25 of the 50 U.S. states, in their original constitutions, provided for representation of community (town or county) in at least one chamber of the legislature (Ansolabehere and Snyder 2008, 49). Of course, most of the states had as a model the U.S. federal system, where communities (states) received equal representation in the Senate while population (with a minimal guarantee of representation to each state) granted in the House.

3.1 Historical Use of Geographic Districting Principles

Therefore, since the founding of the nation, place and geography have played an important role in U.S. legislative districts. Even in legislative chambers in which seats were not apportioned by county or town, geography remained a key element in districting. Many states had laws prohibiting district boundaries from crossing county or city boundary lines (Ansolabehere and Snyder 2008; Altman 1998a). Counties were the building-blocks of electoral districts. This, of course, makes sense: not only were counties in charge of the administration of elections, they, along with towns and cities, were the only political units associated with population data from the Census. Thus throughout the first half of American history, district boundaries followed political units like towns and counties (especially counties). In fact, 303 of the 386 House districts in 58th Congress (1903-1905) were determined entirely by county boundaries or were

exactly coterminous with entire cities.[1] This number surely underestimates the degree of overlap between congressional districts and political subdivisions: town boundaries were also frequently used in redistricting. Altman (1998c) in a detail examination of the use of traditional districting principles over time, counts fewer than 40 congressional districts in the 58th Congress which split county boundaries but failed to follow other subdivisions such as wards, county townships, or precincts. Only in large cities like New York, Philadelphia, and Boston was county-based district creation impossible.

A consequence of using counties, towns, and cities for legislative districts or as building-blocks of districts is the creation of relatively compact legislative districts. Counties tend to be compact political units, especially in Midwestern and Plain states. Only along the coasts and in mountainous areas are counties not compact. Of course, non-compact districts can still be drawn from a collection of contiguous counties: the original gerrymander famously followed Massachusetts township boundaries, after all. Yet in general, following political subdivisions acted as a constraint on district design resulting in relatively compact legislative districts.

Altman (1998c) also offers a look at the compactness of congressional districts over the course of U.S. history. Compactness requirements first entered state constitutions in 1821 and congressional apportionment legislation in 1901 (Altman 1998c, 171-172). But defining compactness has always presented problems; most states and congressional legislation to impose compactness standards have left it undefined (with Colorado, Iowa, and Michigan being notable exceptions to the rule). A compactness requirement for congressional districts was short-lived. Lasting two

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[1] This count was created by reading district descriptions found in Martis (1982).

decades, the compactness requirement was not included in Sen. Vandenberg's automatic apportionment legislation of 1929. Despite these changes in legislation, Altman's analysis shows remarkably little change in compactness scores across redistricting cycles prior to 1960. In other words, congressional districts and districting plans since the first Congress remained fairly compact, displaying little over-time variation.

The 1960s changed everything. Before the '60s, redistricting was the purview of the state legislatures and only the state legislatures. But with the court rulings in *Baker* v. *Carr*, *Reynolds* v. *Sims*, and *Wesberry* v. *Sanders*, the court became an important player in redistricting. Further, the population equality standard instituted by these cases along with the 1964 Voting Rights Act significantly constrained districting practices in the states (Weber 1995).

It is important to note the conflict between geographic districting principles like compactness and coterminousness on the one hand and population equality on the other (Cain 1984). In some cases (like the U.S. Senate and many upper chambers of state legislatures before the 1960s), seats were apportioned by political unit such as the state, county, or city instead of population. In these cases, population equality was not a goal; representation was based on geography only. In many situations the true goal was to maintain power of rural interests over urban ones (Ansolabehere and Snyder 2008). The conflict between these goals of representation is obvious. But even in situations in which representation was not granted to geographic political units, using subdivisions as building-blocks of districts makes population equality nearly impossible in many states. A strict population equality standard requires fine-tuned population data below the

county level. It requires breaking-up political units into separate districts (to some extent) to tweak the numbers.

It should be no surprise, then, that when the court entered the "political thicket" of districting in the landmark malapportionment cases, districting changed dramatically. In *Baker* v. *Carr* (1962), the Supreme Court ruled redistricting policy to be a justiciable area, not simply a political issue left for the workings of the political process. In *Reynolds* v. *Sims* (1964), the Court instituted intra-state population equality as a necessary requirement for state legislative districts, including both the lower and upper chambers. *Reynolds* v. *Sims* effectively stopped representation of towns and counties in state legislatures; districts must be based on population. This ruling was extended to congressional districts in *Wesberry* v. *Sanders* (1964). In two short years, the Court forever changed the way legislative district were drawn and representation was granted in the U.S.

The consequence of the reapportionment revolution for legislative districts can hardly be overstated. While it necessarily ended the representation of places instead of people in state legislatures and the extreme malapportionment and underrepresentation of urban voters that came with it, it also had serious consequences for the district characteristics of interest in this study. First, population equality meant districts could not simply be aggregations of counties. Further, since virtually every state tolerated some level of malapportionment before these cases, legislative districts switched from rural to urban areas. Highly populated urban areas force district lines to be drawn without reference to county boundaries - there is simply no other way to create districts with

equal constituency sizes. Freeing districting from subdivision boundaries and requiring population equality led to less compact districts.

Altman's (1998c) work clearly highlights these trends. By 1973, the number of congressional districts splitting counties or cities without following other boundaries such as state legislative districts more than doubled the 1963 amount; over 40% of all congressional districts failed to be coterminous with county or place boundaries. My estimates for current levels (see Ch. 5) are much higher. Of course, the consequences of these rulings affected compactness as well: Altman's data show a drop in compactness in each decade following the Court's rulings.[2]

The reapportionment revolution was not the only change to come to redistricting in the 1960s. The passage of the 1964 Voting Rights Act also changed the process. The VRA required the creation of majority-minority districts in states with a history of racial discrimination in elections. However, the degree to which the VRA effects district characteristics is dependent on the distribution of minority populations across a population (Altman 1998b). If the minority population is dispersed across the state, then only noncompact districts could generate majority-minority districts. It is perhaps no surprise that the next round of changes to redistricting came when the Court considered the racial gerrymander in the 1990s.

Shaw v. *Reno* (1993) is the first instance of the Court citing “traditional districting principles.” The case concerned North Carolina’s districting plan that created a majority-

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[2] Altman tests compactness using three separate measures of the concept. While there is a clear decrease in compactness after the 1960s across all three measures, the decrease is most consistent and steep using a perimeter/area measure similar to what I use, as explained in the final section of this chapter.

minority 12th district. Five North Carolina residents brought the case against state and federal officials, claiming the district resulted in a racial gerrymander. Justice O'Conner, writing the majority opinion on the case, clearly views districting principles like compactness and coterminousness as a way to alleviate the appearance of racial gerrymandering: "traditional districting principles such as compactness, contiguity, and respect for political subdivisions" are important because "they are objective factors that may serve to defeat a claim that a district has been gerrymandered on racial lines" (509 U.S. 630 (1993), 647). O'Conner also suggests that racial gerrymandering may negatively impact voters by reinforcing "the perception that members of the same racial group—regardless of their age, education, economic status, or the community in which they live—think alike, share the same political interests, and will prefer the same candidates at the polls" (509 U.S. 630 (1993), 647). Appearances, O'Conner argues, do matter when it comes to reapportionment.

In *Bush* v. *Vera* (1996), the Court heard another racial gerrymander case. At issue in this case was the state of Texas' congressional district boundaries. Reaffirming the principles establish in *Shaw*, the Court ruled the Texas districting plan to be unconstitutional due to its racial gerrymandering. But again, the Court explicitly cited compactness and coteminousness as key components of "traditional districting principles." By drawing district boundaries on the basis of race—instead of using race-neutral principles like compactness, Justice O'Conner argues in the majority opinion that the plan can cause "expressive harms" to voters. The term "expressive harms" was coined by Pildes and Niemi (1993) to refer to harms derived from the ideas or intentions behind government action and is cited by the Court in *Vera*. Pildes and Niemi suggest

Court rulings in *Shaw* should be viewed as a concern about the appearance of legitimacy in the political system: "in the Court's eyes, oddly shaped race-conscious districts compromise the values of political integrity and legitimacy." The creation of bizarre districts give the appearance that "politicians are engaged in manipulation of public institutions for their own ends" (1993, 502). Compactness and districting with regard to political subdivisions are principles that, according to Pildes and Niemi's interpretation of Court rulings, might impact citizen views of the legitimacy of political institutions and the motives behind political actions.

3.2 Districting Principles and Representation

3.2.1 Geographic Compactness

Using the framework developed in Chapter 1, arguments for how compactness influences representation can now be laid out. Compact districts can enhance linkage and communication in two ways. First, compact districts make campaigning easier for representatives. Irregularly shaped districts make virtually every campaign mobilization effort less effective (see Engstrom 2000). Non-compact districts may reduce the effectiveness of media advertisements, since districts may cross several media markets. Also, non-compactness reduces the effectiveness of mass mailings, since they are often done by zip code or city. Further, non-compactness raises travel costs for the representative. All told, non-compactness should make the representative's job of spreading information about oneself to the district more difficult, and thus should weaken the relational tie between constituents and representative.

Second, irregularly shaped districts may confuse voters by making it difficult to figure out in which district they live (Engstrom 2000; Butler and Cain 1992). Complex

district lines following no recognizable pattern in the eyes of citizens, increasing the information costs needed for citizens to place themselves within a district. The harder it is for citizens to recognize in which district they reside, the smaller the number of citizens who will find out this information. This confusion should have effects on the campaign and legislator-constituent interaction afterward. Citizens, if they have difficulty discovering their legislative district cannot receive appropriate campaign messages, particularly from unknown challengers. Further, such difficulty should make it harder for citizens to contact their representatives after the election.

Non-compactness can increase the difficulty of being responsive to constituent demands for legislators due to the creation of heterogeneous districts. Since residents tend to live around those similar to them, a compact district would likely group together persons of similar occupations, income levels, and interests (Barkan, Densham, and Rushton 2006). Non-compactness may lead to a diversification of interests and demands placed upon the representative, including making it difficult to find a "lowest common denominator of interests" in the district (Fenno 1978, 5).[3] One might call this *geographical homogeneity*; any interest or characteristic that is geographical clustered across a population should see greater within-district homogeneity (and less between-district homogeneity) if districts are geographically compact.

[3] Of course, it is possible to draw non-compact districts to maximize the homogeneity of some other characteristic, like partisanship or race. Both Brunell (2008) and Buchler (2005) argue for the creation of purposeful partisan gerrymanders to create homogeneous legislative districts.

3.2.2 Boundary Coterminousness

Some of the same points made in the previous section apply here as well. Drawing district lines to overlap with existing political subdivision boundaries may reduce voter confusion and thus increase the communication between representative and constituents. In such situations, legislative districts, which are transitory political units, can borrow the depth and rootedness of other units like states, counties, cities, and towns. Residents may not always know which congressional or state legislative district they reside in, but do know what county and town they live in. These political entities have meaning for everyday life (i.e. they levy taxes and provide public services). When district lines are drawn over these more immediate and recognizable political boundaries, legislative districts should become less confusing for voters and, for that matter, representatives (see Fenno 1978). Like compactness, coterminousness should reduce voter confusion, making it easier to identify their own districts and thus make information transmission between legislators and constituents more effective. Again, the information-enhancing effects should exist both during the campaign and afterward: constituents should receive more campaign information when boundaries are coterminous then when they are not, and they should be able to more effectively communicate their opinions to their representatives when they can easily identify their district.

Drawing district lines over county or city boundaries also make the district easier to represent because residents of cities and counties share many of the same interests, if only because they already belong to the same political communities. In other words, coterminousness increases a particularly kind of homogeneity: *community homogeneity*. By living in the same community, citizens share the same public schools, the same

property taxes, in many instances the same public service provisions, and the same budget issues. Representatives, particularly at the state level where the interaction with local government is greatest, may find their abilities to represent citizen demands in the legislature heightened by districts that follow city or county boundaries. Malcolm Jewell (1981) provides additional evidence that community homogeneity is important: interests and media essential to policy input and communication tend to be organized at the county or city level, meaning that when legislative districts break up counties or cities, they can diminish the active participation of local interests *and* create communication barriers for the legislator.

> Probably the most obvious case of distorted representation occurs when a small portion of a county, with a few hundred or a few thousand persons, is detached from the main part of the county and attached to another district. Unless the legislator makes heroic efforts to overcome the communication barrier, he is not likely to be known by the voters in this fragment. More often than not, they will contact the legislator who represents the rest of the county; he may handle their problems or forward them to the other member. *Where legislative district lines have created such fragmentation, many constituents are represented de facto by legislators for whom they have no opportunity to vote* [emphasis mine].
>
> (1982, 60).

This quote from Jewell highlights both the homogenizing and communicating forces of coterminousness. Constituents think about representation in terms of known political units, like counties, and representation is structured on the organization of interests, voters, and political parties at the local level. Divorcing legislative representation from these units creates inefficiencies in representation and likely to poorer representation of the fragmented units.

Fenno (1978) finds ample evidence that both district shape and the choice of line placement affects representatives' behavior. He records one experience traveling with a House member whose district boundaries had just been altered through redistricting:

> As we drove around, we were constantly reminded of [the district's] artificiality.
>
> > 'I'll bet there isn't another district as hard to get around in as this one. It's so cut up that I can't deal with any single community as a whole.'
> >
> > 'Let me pull over to the curb and look at the map. I can't tell whether this area is in the district or not. It could be, but I'm not sure. That must have been some redistricting when the congressman who represents the district can't even tell whether he's in it or not. What a mess.'
>
> His district had not always been so 'cut up' or messy. The redistricting had removed the largest and most dominant community from his district, a community which had been a homogenizing influence. (1978, 6).

The representative quoted by Fenno views district shape and line placement to matter. The quotes lend anecdotal evidence in support of my arguments that shape and line placement can be confusing to representatives and that the sort of political community created by the drawing of boundary lines also may impact the ease of responsiveness.

3.3 Constituents, Representatives, and Redistricting

Does the empirical literature on redistricting support these theories? The vast majority of the work on redistricting has focused on the partisan and racial gerrymanders and do not examine geographic districting principles (e.g,Tufte 1973; Niemi and Winsky 1987; Gelman and G. King 1990, 1994). Yet this literature can add some evidence that the causal mechanisms specified above matter in redistricting.

Recent literature on districting has found an important link between districts and the representational relationship. Focusing on the incumbency advantage in U.S. House races and the role of the personal vote – the percentage of a candidate's vote share derived neither from party attachment or voter characteristics but from items unique to the candidate (i.e. voting record, constituent service, personality, and homestyle) (Cain, Ferejohn, and Fiorina 1984) – this literature has relied on redistricting as a natural

experiment to quantify the personal vote portion of the incumbency advantage. Decennial redistricting and a population equality requirement mean most House incumbents face, in the first election following redistricting, a district composed of parts of their former district and some new portions. Thus, support in the new portions of the district can be compared with support in the old to measure the importance of the link between the representative and her constituents for electoral support.

Both Ansolabehere et al. (2000) and Desposato and Petrocik (2003) use this method and find evidence that incumbents cultivate a personal vote among their constituents; in other words, they receive greater support from voters in the old parts of the district than in the new parts, controlling for differences between the old and new portions of the district. Using GIS to merge cartographic data with census data, Crespin (2005) finds a similar result pertaining competition: incumbent vote share for House races is higher the greater the proportion of the district population that remains in district after redistricting.

Fleshing out the connection between districting and the personal vote, McKee (2008a) and Hayes and McKee (2009) show that redistricting has important consequences on the representational relationship for individual respondents. Respondents living in redrawn areas and facing new incumbents were significantly less likely to recall and recognize the name of their new incumbents than were those respondents remaining in the same district. This effect influences turnout: respondents in redrawn areas less likely to vote on House races. Hayes and McKee (2009) estimate this effect as a three to eight percent increase in the probability that the voter will roll-off, or abstain from voting on the House race.

Other research along these lines also shows that changes in the demographic characteristics of legislative districts due to redistricting alters the types of issues about which House members sponsor and co-sponsor legislation (M. Hayes, M. V. Hibbing, and Sulkin 2010). In other words, legislators respond to changes in their geographical constituency by paying extra attention to those issues of importance to the new constituency when setting their legislative agendas. Crespin (Forthcoming) finds similar evidence that U.S. House members tailor their final votes on bills to respond to shifts in the district's ideology due to redistricting, although this responsiveness does not exist on procedural votes.

These findings are relevant to the purposes here. Representatives cultivate a connection to voters, and changes in district boundaries can make that process more difficult. Further, this research makes explicit the link between redistricting and information costs: new districts entail great work for the legislator to get information to the voters about herself. The informational effects have real consequences for the representational relationship by reducing the likelihood voters can identify their representatives and the probability they will vote. Finally, representatives respond to changes in the district by changing their behavior, changing their sponsorship of bills to match the demographic characteristics of their new district. In short, districts certainly influence the representational relationship by affecting the transmission of information between legislators and constituents as well as legislative behavior.

Very little empirical research has directly examined geographic districting principles like compactness and coterminousness. Instead, the research has been focused on other forms of district homogeneity and heterogeneity: the partisan and racial

gerrymanders. Gerrymanders tend to maximize either homogeneity or heterogeneity by "packing" certain types of voters (say, Republicans) into a few districts so statewide their vote is diluted, or by "cracking" the support of some political group by spreading out their votes across multiple districts and thus ensuring they receive a minority status in the districts. It is important to note that both gerrymandering strategies concern the relative homogeneity of districts.[4]

Despite this literature, very few studies have examined the relationship between compactness and coterminousness and individual or political outcomes; the ones that do have tended to study the influence of these principles as constraints on gerrymanders (Altman 1998b; D. D. Polsby and Popper 1993; Winburn 2009) or affecting descriptive representation of minorities (Lowenstein and Steinberg 1985; D. D. Polsby and Popper 1993; Barabas and Jerit 2004; see La Raja 2009). A few studies have looked beyond representation of party and race to the fundamental connection between districting principles and the representational relationship. The empirical results, however, are mixed. Only three studies have examined the empirical relationship between compactness and respondent behavior or evaluations of government: Engstrom [site] finds evidence that respondents living in compact districts are more likely to vote in U.S. House races,

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[4] One of the difficulties in theorizing about the potential effects of various districting criteria is the counter-factual: how would districts be drawn if they are neither compact nor coterminous? Because of the large amount of information available to mapmakers and the fact legislators and commissions are largely unconstrained during the redistricting process (except for VRA pre-clearance and equal population requirements), mapmakers have great power to create district boundaries that maximize whatever it is they want to maximize. Thus some districting plans maximize incumbent protection (Schaffner et al. 2004), partisan gain (McDonald 2004), or descriptive representation of minority groups. Each of these cases involves using some criteria, like partisanship, race, or incumbent voter support as a basis for district creation. In other words, each situation can create *homogenous* districts based on one or more criteria to lead to a certain political outcome by packing certain types of people into the same district.

but discerns no noticeable effect of compactness in a later study (2005). Altman (1998a) finds a similar connection between compactness and turnout, but he finds no relationship between compactness and trust in the federal government or respondent assessments of whether their House members stay in touch.

The research on coterminousness is more decided. Niemi et al. (1986) find that survey respondents are more likely to recall and recognize the names of their U.S. House candidates when their community of residence falls within only one congressional district than when it is broken into several districts. They empirically demonstrate this result is related to a similar finding between knowledge of candidates and their district's overlap with television media markets.[5] Winburn and Wagner (Forthcoming) have reached a similar finding using improved measures of district-county and district-media market overlap. They do not, however, find evidence that coterminousness leads to higher turnout, a finding partially supported by Engstrom (2005).[6]

To summarize the existent literature on geographic districting principles: there is ample evidence to support the notion that the location of districts matter for the representational relationship. Legislators cultivate a connection with their constituents and shifting boundary lines hurts incumbent reelection. Further, some evidence suggests a connection between districting principles and turnout, predicated on the notion that some district characteristics make campaigning easier for candidates by matching

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[5] Niemi et al. (1986) use relatively rough measures of coterminousness by categorizing the fragmentation of communities into three categories by the number of congressional districts assigned to each community.

[6] Enstrom's study discovers no relationship between district-county overlap and turnout, but he does see a positive connection between district-media market overlap and turnout.

districts with media markets. Real effects of this linkage can be found in the ability of citizens to recall information about their representative. This literature, however, has focused almost exclusively on U.S. House representatives and candidates and used either aggregate turnout data or measures from the ANES. Further, the literature on compactness and coterminousness is mixed with some evidence those districting principles impact communication between citizens and legislators and/or turnout, but no evidence such affects extend to evaluations of representatives. In short, there is much need for a deeper and broader examination of the role districting principles in shaping the representational relationship.

Despite for the somewhat conflicting research on geographic districting principles, the expected relationships are clear: compact districts and districts with boundaries that are coterminous with political subdivision boundaries should lead to a closer representational relationship. These connections should be evident in survey data: residents living in compact and coterminous districts should be more likely to evaluate their representatives, legislatures, and government positively and report greater communication and information transmission with their representatives than do respondents from noncompact or non-coterminous districts. These expectations apply equally to the state and congressional district levels.

3.4 Operationalization and Measurement

At the core of this project is a large data collection initiative. Recent technological developments have made measuring district characteristics possible, if the investigator is armed with the proper cartographic data and computer software. The U.S. Census Bureau has released computer files containing detailed maps of state legislative and

congressional districts in the 2000s. The analysis relies on two files types from the Census Bureau: TIGER/Line Shapefiles and cartographic boundary files.[7] These files make it possible to locate every boundary of every state legislative and congressional district (after the 2000-2002 round of redistricting). Using GIS, these files can be analyzed to give any number of geographic properties and measurements. The advancement and availability of GIS technology along with the accessibility of cartographic data make this project possible.

While operationalizing constituency size is relatively straightforward, finding a suitable measure of geographical compactness has proved difficult to many political observers. Most research on compactness in political science is devoted to how the concept should be measured, rather than any test of empirical results. Several dozen measures have been proposed (Young 1988; Niemi et al. 1990; Altman 1998a), each tapping some aspect of the concept of compactness.

Any reasonable measure of compactness must measure dispersion (the distance of boundaries to a central point) and perimeter length (Niemi, Grofman, Carlucci, and Hofeller 1990). In other words, inherent in the concept of compactness is the fact that a square or circle, where all boundaries are roughly equidistant from the center point is more compact than an elongated, finger-like district. Likewise, in a comparison of two districts with equal area, the one with a shorter perimeter should be considered more compact.

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[7] These data are publically available on the Census Bureau's website: TIGER/Line files are available at http://www2.census.gov/cgi-bin/shapefiles2009/national-files, and for cartographic boundary files, go to http://www.census.gov/geo/www/cob/bdy_files.html.

The theory outlined earlier echoes this statement. First, for homogeneity to work as a causal mechanism, residents who live close to one another need to be grouped in the same district, which supports the reasoning behind including a dispersion measure. Second, districts should be punished when boundaries lines are long and complex, given the district's size. This complexity of boundaries makes it difficult for citizens to place themselves within a districting plan and increased the information costs associated with paying attention to campaigns and contacting elected officials. Armed with these two crucial criteria, a suitable compactness measure can be selected.

The most popular measure of compactness fits both of these requirements. The measure is a ratio of the district's area to the area of some compact shape (like a circle, square, or hexagon) whose perimeter is equal to the district perimeter. Thus a district that is perfectly circular would receive a score of 1. This measure has the benefit of punishing both non-conformity in dispersion (areas jutting out from the main mass of the district), bizarre shapes (like the North Carolina's 12th congressional district), and complex boundaries. Variations of this measure have been used in simulation studies (Barkan, Densham, and Rushton 2006), and two of the few empirical studies to examine effects of compactness (Engstrom 2000, 2005). Further, this measure is commonly thought to be the most popular measure of compactness (Hofeller).

The strengths of this measure are apparent when considered alongside other measures. For the sake of comparison, three easily described measures are presented in Figures 3.1 – 3.3. Figure 3.1 shows the compactness measured used throughout this project. The 34th Oklahoma Senate district is highlighted in black. The figure presents a black circle which encompasses the district. This circle has the same circumference as the

district perimeter – 102 miles. Once this easy calculation is completed, a compactness score can be generated by simply taking the ratio of the district's area to the area of the circle. It is important to note that any deviations from a circular shape, be it due to finger-like extensions, jagged boundaries, or indentations, increase the perimeter distance given the area of district. Thus, this measure punishes all those types of deviations from the idealized compact shape.

Figure 3.2 presents another compactness measure suggested by the literature: the ratio of the maximum inscribed circle to the minimum circumscribed circle. Circle B, as the largest circle to fit inside the district boundaries, is the maximum inscribed circle. Circle A is the smallest circle which encompasses the district, or circumscribes it. This measure simple divides the area of Circle B by the area of Circle A, creating a percentage. The closer the two circles are to having the same area, the closer the compactness measure gets to one. A score of one would indicate a completely circular district, where the inscribed and circumscribed circles are identical. Notice from Figure 5 that this measure punishes long extensions (as in the bottom-right corner of the 34th district) and large indentations. Extensions away from the main mass of the district lead to larger circumscribed circles but not inscribed circles (leading to smaller ratios), while indentations reduce inscribed circles while not affecting the circumscribed ones, also leading to smaller ratios. This measure, however, does not punish boundary complexity to any significant degree: one can imagine a district with an entirely jagged boundary but still a generally circular shape. An inscribed circle in such a district would have a similar area to the circumscribed circle, giving high compactness rating according to this measure.

Finally, Figure 3.3 displays a length-width compactness measure. Length-width measures focus on the dispersion of the district, or the degree to which boundaries surround a central point rather than stretching along a single axis. To calculate this measure, one must draw a rectangle encompassing the district, with the district boundaries touching the district on all four sides. Once the rectangle is drawn, the compactness score is simply the width of the rectangle divided by the length. The length-width comparison punishes districts that have long extensions jutting out from the main body of the district, but fails to account for indentations and boundary complexity. It is easy to picture a district which happens to lead to a square-like encompassing rectangle but is hopelessly indented. The 34th Senate district presented in Figure 6 illustrates this fact: even though the district deviates a fair amount from a compact shape like a circle or square, since the North-South and East-West axes are similar in size, the district receives a high compactness score of .86.

Only the first measure, the district-circle perimeter/area comparison discounts all the right factors: finger-like extensions, indentations, and complex boundaries. *Any* deviation from the circular shape reduces the compactness score. The same cannot be said about the other two measures. Since the theory suggests compactness should matter because of homogeneity (people who live close to each other should be grouped in the same district) as well as communication (complex boundaries make it difficult for citizens and representatives to recognize and understand the district), the first measure (shown in Figure 3.1) is the one preferred and used throughout this project. Formally, compactness is calculated as:

$$Compactness = \frac{Area_{district}}{Area_{circle}, where\ circumference = perimeter_{district}}$$

$$= \frac{Area_{district}}{\pi(\frac{Perimeter_{district}}{2\pi})^2} = \frac{4\pi * Area_{district}}{Perimeter_{district}^{\ 2}}$$

Using ArcInfo, a GIS software program, compactness scores were calculated for every state legislative and congressional district in 2006 as well as congressional districts in 1996 and state legislative districts from 39 states in 2000. The Census Bureau has released these data as generalized boundary files - files recording the approximate locations of district boundaries.[8]

While a large literature has examined and debated measuring compactness, only a handful of studies have attempted to measure coterminousness in any form. In practice coterminousness appears in statue as not splitting counties or cities into multiple districts when possible (i.e. when the population of the county or city is less than the ideal population of the district) (Cain 1984). Following this general concept, Winburn (2009) calculates the percentage of counties in eight states which lie below the average constituency size of state legislative districts and are split into multiple districts. Niemi, Powell and Bicknell (1986) use a similar measure: a count of the number of congressional districts each county is split into. Some recent work has improved on these measures to create continuous, district level measures of coterminousness: Engstrom

[8] This discussion of alternate compactness measures is limited. For better discussions of the tradeoffs between alternative measures, as well as a more complete survey of compactness measures, see (Young 1988; Niemi, Grofman, Carlucci, and Hofeller 1990; Altman 1998a). Also, all of the measure considered here deal with formal compactness as a measure of district shape, without regard to population patterns. Other measures have been developed, like the population moment of inertia, which take into consideration residential patterns. One potential drawback with the measures of compactness and coterminousness used in this project is that they assume even population distribution across the area of the district.

(2005) and Winburn and Wagner (Forthcoming) use related measures that calculate the percentage a district which overlaps with whole counties.

These measures have several flaws. First, it is important to create a district level *continuous* measure of coterminousness. A district which mirrors subdivision boundaries closely for much, but not all, of the district should receive a higher coterminousness score than a district which ignores subdivision boundaries all together. In other words, the concept itself is continuous, and the measure should be as well. Second, state legislative and congressional districts regularly follow city and town boundaries as well as counties. Particularly in suburban and urban areas, strict population equality makes it impossible to use counties guides for district boundaries; mapmakers can and do use local governmental boundaries during redistricting. Theoretically, since citizens know their community of residence, creating districts with boundaries that are coterminous with city or town boundaries aides in reducing information costs just like following county boundaries does. Further, cities and towns have local interests to be protected in government, just as counties do. It is essential, then, that any accurate measure of coterminousness use both county and city/town boundaries.

Finally, measuring coterminousness as the previous research has ignores the informational costs associated with not following subdivision boundaries. Using Engstrom's (2005) measure, a district can be entirely contained within a county, not follow county or city lines, and still receive a high coterminousness score. This is so because his measure is focused only on community homogeneity – the greater the congruence between the district community and the county community, the higher the coterminousness score. Unfortunately, such a measure ignores information costs. A

district like the one described above may make it difficult for citizens to place themselves within the representational system. What is needed is a measure focused on *boundary* coterminousness rather than *area* congruence.

The measure designed and utilized in this project looks only at the overlap of district boundaries, not the congruence between district area and subdivision units. Coterminousness is measured using the following simple equation:

$$Coterminouseness = \frac{Length\ of\ boundary_{district} \cap boundary_{subdivision}}{Perimeter_{district}}$$

Thus coterminousness is measured as the percentage of the district's boundary that is coterminous with a county, city, or town boundary. This measure rewards districts whose boundaries follow other pre-existing political boundaries, and is empirically distinct from measures counting the number of county splits or comparisons between district and county area. To my knowledge, this is the first measure in the literature to focus on boundary overlap.[9]

Creating such a measure was a multi-step process made possible by the use of GIS software. First, Census Bureau Tiger/Line and boundary files for geographical units – counties, incorporated places, and legislative districts, were converted from polygons (enclosed shapes with area) to lines (boundaries only). Then the subdivision boundaries – states, counties, and incorporated places – were combined into one large, subnational file containing the location of all political subunit boundaries.[10] After this file was created,

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[9] While the focus here is on the overlap of district boundaries with other political boundaries, the concept of coterminousness could certainly be extended to other physical and geographical features as well, like overlap with rivers and highways.

[10] In order to generate state boundaries that match with district boundaries, district boundaries were merged by state and then added to the subnational file. This

the intersection of the district boundary file and the subnational boundary file was taken, which kept only the parts of district boundaries drawn over pre-existing boundaries.[11] Then the length of the intersected district portions was measured and compared to the length of the district perimeter.[12]

Figure 7 illustrates this process. The first two panels in the figure, showing subdivision boundaries and congressional district boundaries for Illinois and Indiana, are combined to make the third panel. The dark lines display the coterminous boundaries, while the light red lines are congressional district boundaries which are not coterminous with some other subdivision boundary.

The rise of major representational changes in the 1960s led to a complete overhaul of the redistricting process. District boundaries today are less likely to be geographically compact and regularly ignore city and county boundaries. By enforcing strict population equality, the courts have encouraged districts to break up and fragment geographic and political units. The consequences of such changes should also be real: increased information costs for citizens and legislators to conduct the business of the

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process ensured that all state boundaries were categorized as coterminous with their corresponding district boundaries.

[11] Census Bureau files come as Tiger/Line shapefiles and generalized boundary files. The former is more accurate than the latter. Unfortunately, not every boundary is available as a Tiger/Line file; state legislative districts, congressional districts, and incorporated places are only accessible in boundary file form. Since these files are less accurate, I used a conservative buffer around the district boundaries when creating the intersected sections. If the legislative district was located within 50 meters of a county or place boundary, it was counted as coterminous. This approach surely included some district portions were not intentionally drawn as coterminous, but should minimize the amount of coterminous boundaries wrongfully categorized due to measurement error.

[12] In addition to the steps outlined above, some of the district files are accessed from the Census Bureau by state; in those cases, each state's file was appended together to create one large national file first.

representational relationship and the dilution of geographic and community interests. Again, the prediction is that through both mechanisms we should see a weaker connection between citizens and their representatives as well as more negative evaluations of the representation received. In order to test this theory, a large dataset has been collected on state legislative and congressional districts; using Census data and GIS software, measures of constituency size, geographical compactness, and boundary coterminousness have been created for districts and states across the country. Chapter 4 provides the first examination of theory: the role of constituency size in structuring the representational relationship in the American states and Chapter 5 examines the connection between geographic districting principles and measures of the representational relationship.

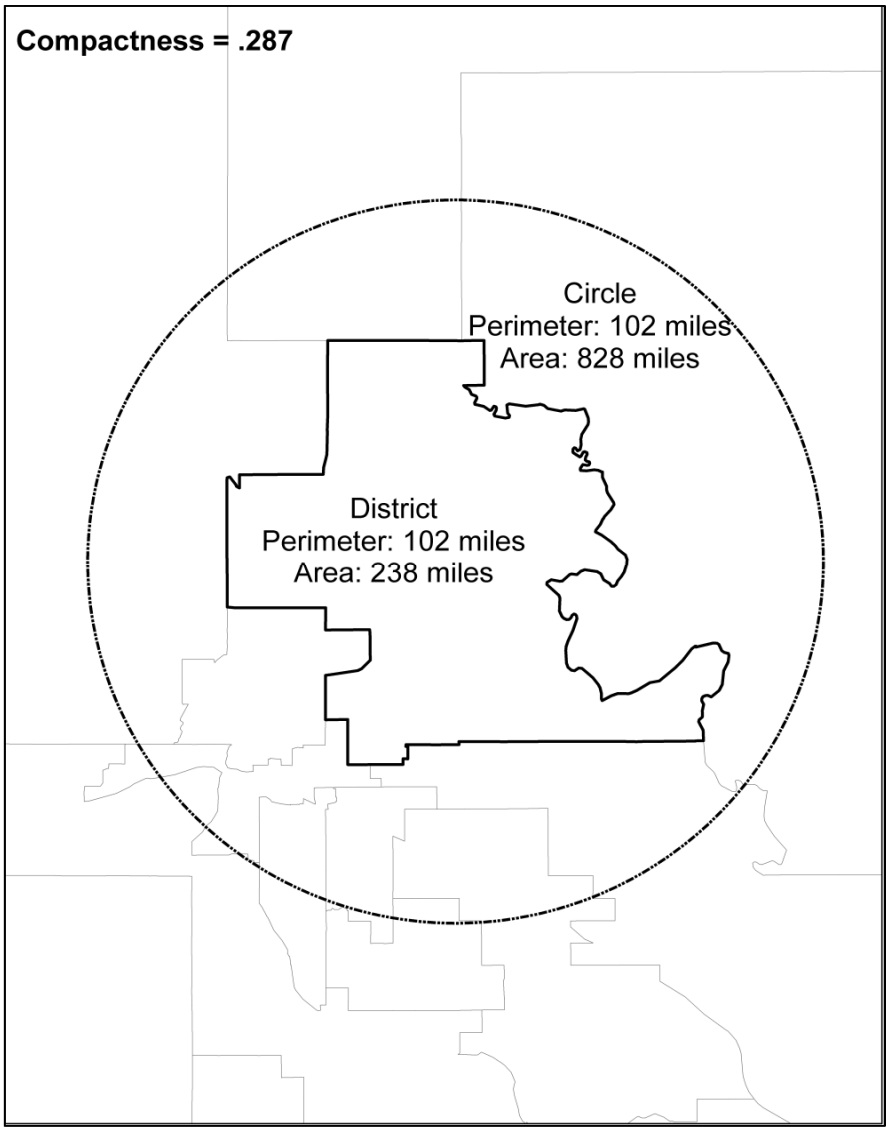

Figure 3.1. Compactness Illustration: District and Circle Perimeter/Area Comparison

Note: Example uses Oklahoma's 34th Senate district covering suburbs north of Tulsa, OK. Compactness measure is: $4\pi A/P^2$, where A is the area of the district, and P is the perimeter of the district. The measure compares the area of the district to the area of a circle with a circumference equal to the perimeter of the district (E. P. Cox 1927; Niemi, Grofman, Carlucci, and Hofeller 1990; Altman 1998a).

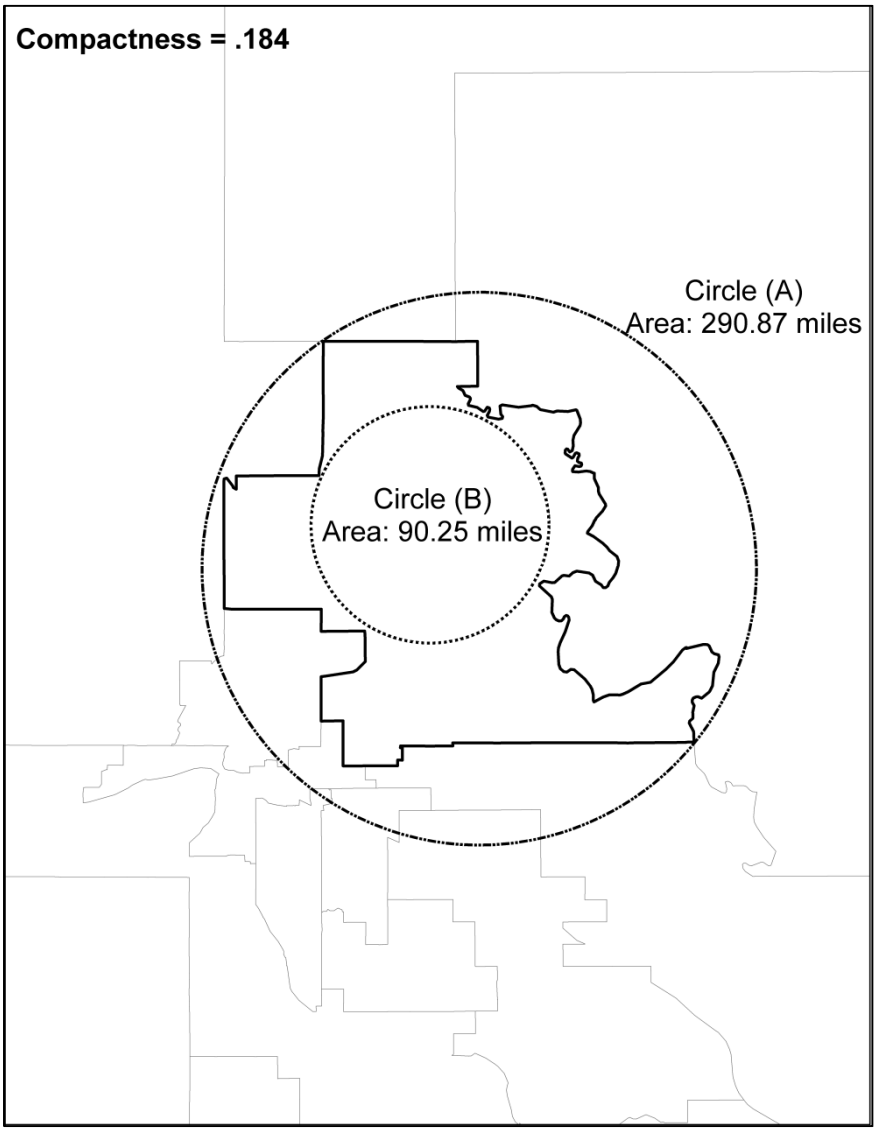

Figure 3.2. Compactness Illustration: Inscribing Circle and Circumscribing Circle Comparison

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Note: Example uses Oklahoma's 34th Senate district covering suburbs north of Tulsa, OK. Compactness measure is: A_i/A_c, where A_i is the area of the greatest inscribed circle, and A_c is the area of the smallest circumscribed circle. (E. P. Cox 1927; Niemi, Grofman, Carlucci, and Hofeller 1990; Altman 1998a).

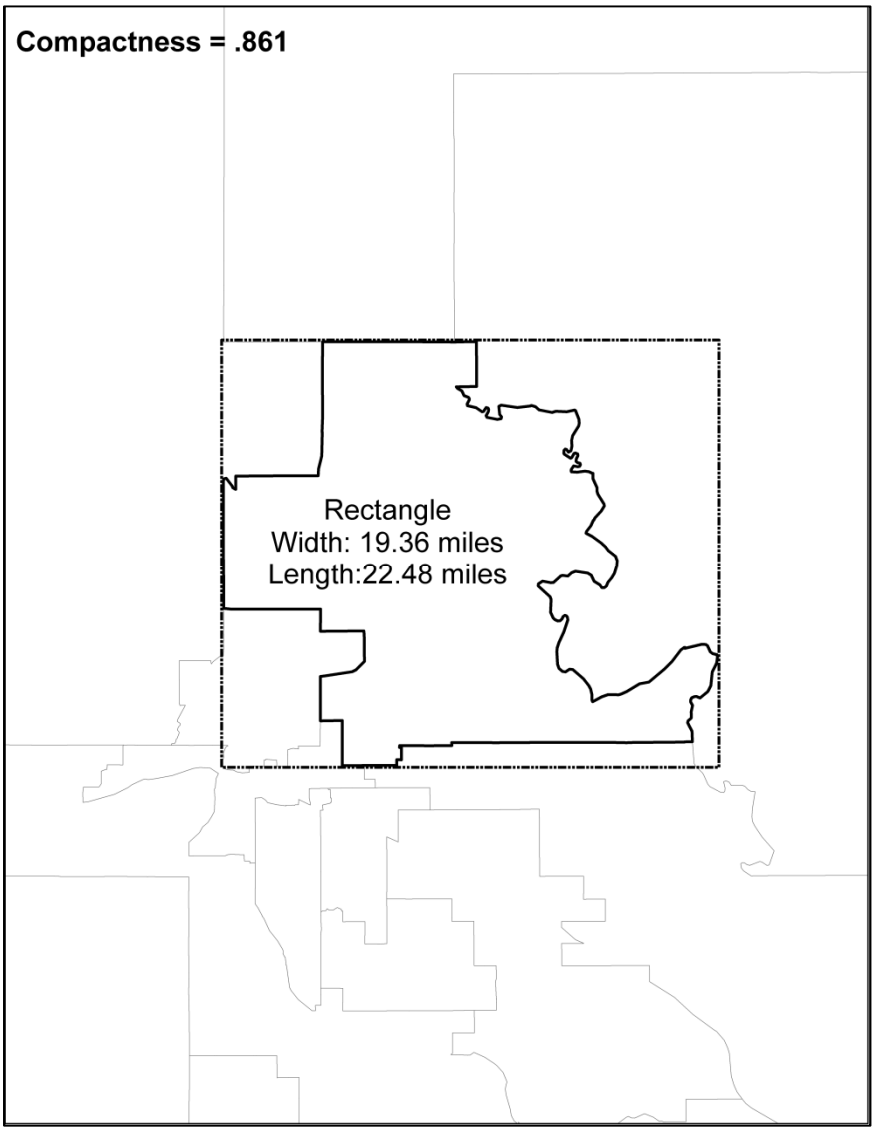

Figure 3.3. Compactness Illustration: Width Length Comparison of Enclosing Rectangle

Note: Example uses Oklahoma's 34th Senate district covering suburbs north of Tulsa, OK. Compactness measure is: W/L where W is the width of the smallest rectangle enclosing all four sides of the district, and L is the length of the rectangle (Niemi, Grofman, Carlucci, and Hofeller 1990; Altman 1998a).

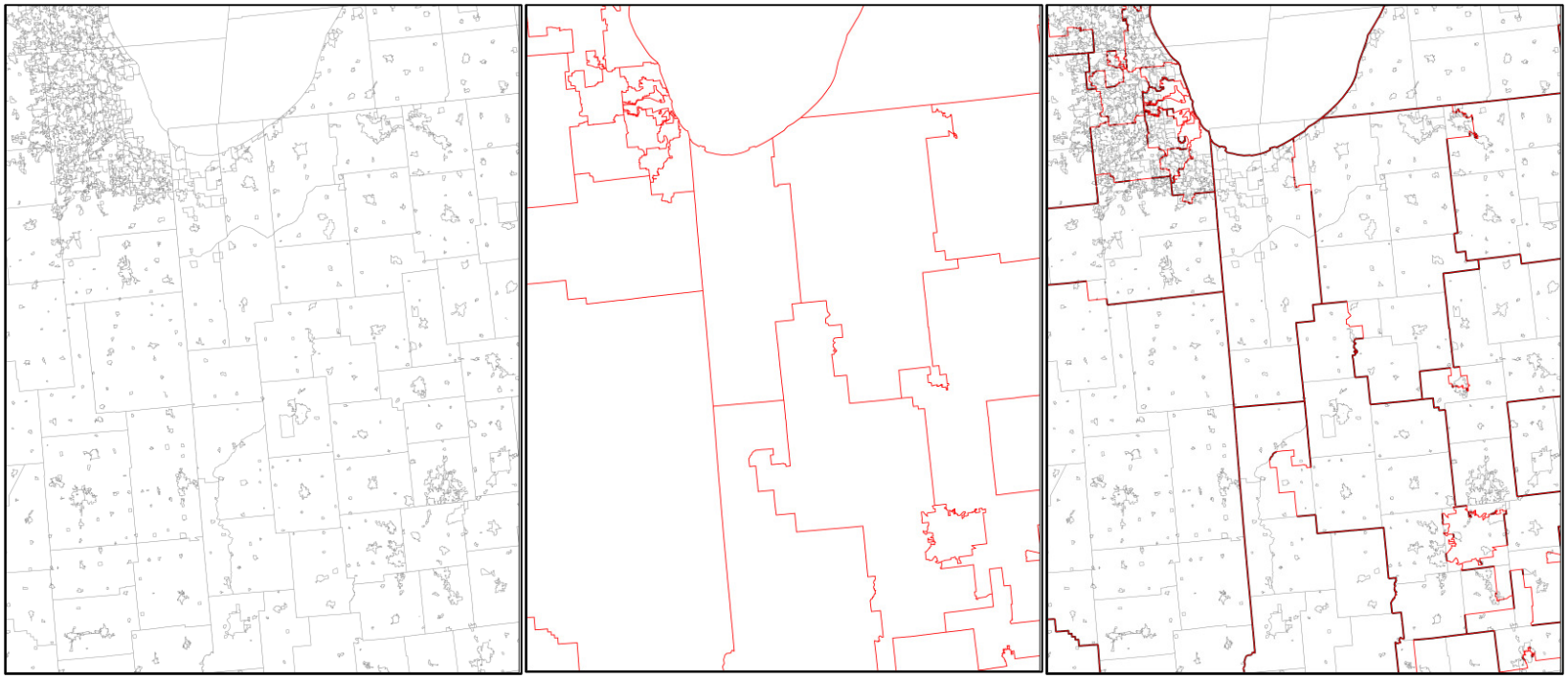

Figure 3.4. Example of Coterminous Boundaries, IL and IN 110th Congressional Districts, Counties, and Incorporated Places

Note: First panel displays county and incorporated place boundaries in 2000. Second panel shows the 110th congressional district boundaries covering Illinois and Indiana, including the Chicago and Indianapolis metropolitan areas. The third panel presents the overlap between the two maps: dark lines denote coterminous boundaries, while red lines are congressional district boundaries that do not overlap with subdivision boundaries. Maps were created using ESRI's ArcMap software. Original data from the U.S. Census Bureau's Tiger/Line shapefiles and generalized boundary files.

CHAPTER 4. CONSTITUENCY SIZE AND REPRESENTATION IN THE STATES

> Citizens want to feel their representatives care, that they have not become one of "those people" at the state capitol.
>
> Alan Rosenthal, *The Decline of Representative Democracy*

We rarely notice that scale matters. Technology has, in many ways, conquered scale. Distance can be traversed quickly, safely, and cheaply with cars and highways. Information is passed instantaneously through the media, mass mailings, websites, and email. Legislators, then, have many avenues by which they can communicate with constituents. Likewise, citizens can contact their representatives, be it during the legislative session at the state capitol, in the district, or via email, relatively painlessly. Technology has undoubtedly reduced the political importance of scale concerns.

However, there is a lingering question of the *quality* of communication engaged via technological advances. Does an email "count" the same as a face-to-face conversation where non-verbal cues are absent? Can citizens learn the same information about a candidate through television advertisements and mailings as they would in conversation with the candidate at their front door or in a town hall meeting? I suggest the answer to these questions is no. District scale intervenes in the representational relationship to structure the interactions between constituents and representatives. In other words, technology may have conquered scale concerns by making contact and communication possible in large-scale settings, but such contact may not produce in citizens or legislators the same opinions or behaviors that would be found in a relationship predicated on districts of smaller scale.

Scale concerns have received relatively little attention in studies of legislative behavior or public opinion (Squire and Hamm 2005). Perhaps the primary reason for this is the U.S. House of Representation's equal district population size within states and similar size across states. State legislatures, however, vary dramatically in the scale of legislative districts and provide an excellent opportunity to examine the effect of scale on representation, political trust, and public opinions.

4.1 Constituency Size in the States

A state's constituency size is the average number of residents per legislative district. It is made up of two items, both of which display great variation across the U.S. states: population and the number of seats in the state legislature. From the forming of the nation, states have boasted very different population sizes ranging from the populous states of New York, Pennsylvania, and Virginia, to the small states of Rhode Island and Delaware. The U.S. has always been an amalgamation of very differently sized states. America's unique bicameral federal legislature, with representation in one chamber based on population and the other on geographical units, reflects this variety and the competing interests inherent in the mix (Zagarri 1987).

Of course, population is not stationary. As the country transformed from a small, agrarian society on the fringe of global geo-politics into the world's most powerful nation-state and immigration center, the U.S. population boomed. The expansion of states across the North American continent and 20th century urbanism facilitated this population explosion. But the growth has also been uneven. Today a handful of very large states dominate the population numbers. Over one out of every four Americans

(approximately 80 million) live in California, Texas, or New York while 15 states have less than two million residents each.

Legislative chamber size has varied across states and over time as well. Currently, the number of seats in the lower chamber of the legislature range from Alaska's 40 to New Hampshire's 400. The average lower chamber size is 110 seats with a standard deviation of over 56 seats. The upper chambers display less variation, ranging from Alaska's 20 to Minnesota's 67 seats. These two variables - population and chamber size - are only weakly related to one another. Large states, California in particular, have relatively small chamber sizes, while many small states have large chambers.

4.1.1. Components of Constituency Size

Scholars use the term legislative constituency size to measure the number of citizens represented by each lawmaker. It is best to think of constituency size as state population augmented by chamber size, particularly lower chamber size. The lower chamber of the state legislature is the larger of the two chambers, boasts the greater variation, and is made to be the closest to the citizenry. In other words, the lower chamber should most closely approximate the wishes and desires of the populace, and its members should theoretically be more open to citizen views, opinions, and communication than any other elected official in state government

Constituency size measures scale as a socio-demographic attribute (population) whose effect is mediated by a political institution (chamber size). Each state has, therefore, only partial control over its constituency size, obtaining the ability to increase

the number of seats allocated to the legislature.[1] But the states have used this ability sparingly in the past half-century. The trend, in fact, as been to *decrease* the size of state legislative chambers, in accordance with good-government recommendations during the legislative professionalization movement (Citizens Conference on State Legislatures 1971). Representatives in American state legislatures, in only 50 short years, have seen their numbers fall by almost 70 representatives while they must represent 130 *million* more constituents.

Historically, population-based representative government is thought to require adjustment for population growth. Both Anti-Federalists and James Madison agreed on this point during the Constitution's ratification debates, and cross-national studies find the same relationship between population and chamber size(Dahl and Tufte 1973; Taagepera and Shugart 1989). Yet Figure 4.1 shows a *weakening* relationship between population and chamber size from the turn of the 20th century to 2000. This is due, primarily, to the lack of action by the states to update their legislative bodies in accordance with population growth over the last century.

In Figure 4.1 the solid lines are the predicted values from a linear regression of lower chamber size on population. In a comparison of each of the time periods, 1900, 1950, and 2000, the slope of the regression line gets flatter over time, showing the weakening relationship. Several states have greatly reduced the number of seats in their chambers such as Connecticut, Vermont, and Massachusetts. The slow rightward movement of the largest of the states – California, New York, Texas, Michigan – from

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[1] This is not a painless activity – it is, rather, a very difficult one. However, given the frequency of changes to the chamber size in the past, it is an activity that is possible if the political will exists for enaction.

frame to frame is perhaps the most important aspect of the figure. Even more surprising is the downward (and rightward) movement of Ohio and Illinois, showing *decreasing* chamber size and *increasing* population. These movements are in stark contrast to the dashed lines in Figure 4.1. The lines denote the cubed root of state population size. Taagepera and Shugart (1989) argue that rational design of legislatures based on communication demands with the citizenry and between legislators would lead to the adoption of the "cubed root law," where the number of seats in a legislature approximates the cubed root of the polity's population size. Further, they find strong cross-national evidence that supports their theory. The American states, however, do not conform to this pattern.

Current constituency sizes are presented in Figure 4.2. The map also shows the size of each state's lower chamber. The disconnect in the largest states (California, Texas, and Florida, in particular) between constituency size and chamber size is obvious from the figure. Further, the map illustrates high constituency sizes for some states due almost entirely to small chamber size. Western states like Nevada, Arizona, Colorado, and Oregon have relatively small chambers, resulting in higher constituency sizes than states in the Midwest or East with similar population sizes.

Constituency size, then, is a state characteristic resulting from demographic and institutional factors. The current history of state constituency sizes is a story of static institutions that have not been modernized to meet a new reality of changing population. Increasing constituency sizes are the result of legislative chambers that have become further removed from the size of their state's population, particularly in those states with growing populations. Despite a growing literature on modernizing election rules for the

21st century (Cain, Donovan, and Tolbert 2008), even election reform scholars have paid little attention to the problem of growing legislative constituency size.

4.1.2 Implications of Constituency Size

Constituency size is a legislator- and communication- centric attribute of districts. In other words, constituency size should theoretically be related to how legislators spend their time, whether staff is needed to supplement legislative workloads, and how campaigns are conducted. Using constituency size as a district attribute should also focus attention on communication concerns – namely the type and quality of constituent-representative interaction.

Legislator-centric

Time, for state legislators, is a precious commodity. Most legislators juggle a job outside of politics and family life with the pressures and demands of elected office. Those representatives hailing from full-time legislatures still face long hours on committee assignments, traveling between the capital and home while the legislature is in session, and a constant stream of citizen requests. And then there are elections, community meetings, and fundraising issues. Time is a key resource for any legislator (Rosenthal 2004, 21-22; Jewell 1982).

As a precious commodity, legislators must spend and manage time wisely. Despite a representative's wishes to the contrary, he or she can only sit on so many committees, draft so much legislation, be present at so many hearings, read a certain number of letters, and provide so much constituent service. What legislators do not have time to do themselves, their staff must do. When staffing resources do not adequately

meet demands, the legislator risks offending constituents, neglecting legislative duties, and jeopardizing reelection.

Constituency size may affect representation by constraining how legislators spend their time. More constituents mean more letters to read, more problems to solve, more groups to visit in the district. Larger constituency sizes should be associated with a greater number and diversity of interests within the district (Dahl and Tufte 1973), which places more legislative demands upon the representative. And finally, more constituents results in the impossibility of retail or grassroots door-to-door campaigning. Professionalized, mass-media campaigns force representatives to spend time raising funds for expensive elections (Rosenthal 1998; Hogan 2000).

Communication-centric

District scale, by influencing workload and therefore the time demands placed on legislators, directly constrains the frequency, type, and number of interactions legislators can have with constituents. Constituency size influences the quantity and quality of legislator-constituent communication by influencing the relative number of constituents with which the legislator can have meaningful contact.

From an informational standpoint, certain types of interactions between constituents and legislators are "better" than others in that they convey more information about the legislator to the constituent and about the constituent to the legislator. First, interactions directly with the legislator are better than indirect communication through a staff intermediary. While staff can be very knowledgeable and helpful on any given topic, they cannot convey the same information about the legislator to the constituent. Constituents, wanting know their representative is listening to their opinions, value direct

communication with their representative over indirect communication. Second, face-to-face communication is better than communication engaged via the mass media, email, or telephone (Putnam 2000). This is so simply because of the wealth of information transmitted non-verbally by facial expressions and body language. The literature on retail politics suggests face-to-face interaction increases the likelihood that respondents can rate candidates on favorability scores, respondents' knowledge of candidates, and respondents' likelihood of rating candidates favorably (Vavreck, Spiliotes, and Fowler 2002). In-person contact between constituents and representatives should provide rich learning experiences: legislators can hear directly what their constituents have opinions on, and constituents can see and hear their legislator defend policies, interact with "real people," and gain information (Dahl and Tufte 1973; Jewell 1982).

3.2. Empirics

Does constituency size influence the representational relationship in the states? The analysis in this chapter is predicated on the assumption that evidence of the quality of representation produced by state legislatures is observable in the *assessments* citizens make of their legislators, legislatures, and state government. Stated differently, citizens dissatisfied with the behavior of their representatives respond to survey questions by rating their government, legislative institutions, and individual legislators poorly. By examining the determinants of evaluations of various aspects of state government, then, we can bring evidence to bear on whether scale influences representation.

Several practical obstacles arise when attempting to evaluate citizen opinions of state government and state elected officials. First and foremost is the general lack of available survey data. While many polling organizations, including academic sources

such as the American National Election Study, ask repeated, detailed questions concerning citizen opinions about the federal government, few surveys inquire about attitudes toward state government and state political actors (for an exception, see Kelleher and Wolak 2007). Further, the few surveys to ask questions about state-level government tend not to question about individual legislators; rather, the questions focus on broad opinions of state government as a whole or perhaps the Governor's office or the Legislature. This tendency makes testing causal mechanisms rooted in personal interactions between citizens and representatives difficult, if not impossible. Finally, most surveys lack the specific geographic identifiers needed to place respondents within state legislative districts. Nevertheless, enough suitable data exist for a test of the influence of district scale on representation and public opinion.

3.2.1. Data

Despite the limitations, this research draws on a rich collection of random national surveys which include questions on trust in state government, favorability of state government, approval of state legislatures, responsiveness of the legislature and representatives, and contact with state legislators, several of which have been designed by the author. In the following analyses, four sets of public opinion surveys are utilized: 1) a group of five pooled Pew Research Center national random sample surveys, 2) three University of Iowa Hawkeye Poll surveys, 3) the Cooperative Campaign Analysis Project 2007/2008 Panel Study (CCAP), and the 2008 Cooperative Congressional Election Study (CCES). These surveys offer variation in the important dimensions of timing of the surveys, attitudes measured, and question wording.

Data from five national telephone polls with a common battery of questions, conducted by Pew, are pooled to create a dataset with large samples from each state. The surveys were conducted during five different years from 1997 to 2005. The 1997 survey was conducted for the Pew Research Center for the People and the Press from late September through early October with over 1700 respondents. The 2001 survey was in the field in mid- November of 2001 and had 1500 respondents. The 2002 survey ran from December 4 through 8 and had 1205 respondents. The 2003 survey was conducted in conjunction with the Pew Internet and the American Life Project. This survey has answers from over 2800 respondents and was in the field in June and July of 2003. Finally, the 2005 survey was in the field from December 7-11 and had just over 1500 respondents.[2] Princeton Survey Research Associates conducted all five surveys. All of the surveys were sampled randomly within states and have respondents from all 48 contiguous states.[3]

All five surveys ask a question about opinions toward state government. Respondents were asked: "Do you have a very favorable, mostly favorable, mostly unfavorable, or very unfavorable opinion of your state government?"[4] This provides a

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[2] All of surveys are available for download from the organizations' respective web sites. The 1997, 2001, 2002, and 2005 surveys can be found at http://people-press.org/. The 2003 survey can be found at http://www.pewinternet.org/.

[3] Random sampling within states is an important advantage of the Pew polls. Other large datasets (the General Social Survey and American National Election Study, for example) use cluster sampling methods which are poorly suited for state-level research in that respondents are not randomly selected within states.

[4] The specific question wording varies slightly across the surveys. The question wording used in the text is question GOV3 in the Pew Internet and American Life Project eGovernment Survey, June 2003. The full question wording is: "I'd like your opinion of some organizations and institutions. Do you have a very favorable, mostly favorable, mostly unfavorable, or very unfavorable opinion of [your state government]?" The same

unique opportunity to study the determinants of those attitudes. Also, pooling the surveys gives added leverage for studying state effects. Very few surveys have enough respondents in small states for accurate estimates. Of the 48 contiguous states, only Wyoming has fewer than 25 respondents in the pooled dataset. The average number of respondents per state after pooling the five surveys is just over 150.

The University of Iowa Hawkeye Poll data consist of three surveys, the first was conducted in January and February of 2008, the second was conducted in October of 2008, and the third was in the field in October of 2009. The January/February survey has approximately 1100 observations of registered voters in 40 states.[5] Respondents were asked if they strongly agree, agree, disagree, or strongly disagree with the following statement: "Your state government can be trusted to do what is right." The October 2008

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question wording was used in the Pew Research Center for the People and the Press Trust in Government Survey (1997), question "Q.3." "Q.5" of the Pew Research Center for the People and the Press December 2002 News Interest Index was worded: "I'd like your views of some people and organizations. As I read from a list, please tell me which category best describes your overall opinion of who or what I name. First, would you describe your opinion of [your state government] as very favorable, mostly favorable, mostly unfavorable, or very unfavorable?" The 2001 Pew Research Center for the People and the Press Mid-November Survey of Media Attitudes, Youth Engagement, and Religion After 9/11's version of the question ("Q.44") was "Now I'd like your views on some groups and organizations. As I read from a list, please tell me which category best describes your overall opinion of the group I name. (First,) would you say your overall opinion of [your state government] is very favorable, mostly favorable, mostly unfavorable, or very unfavorable?" Finally, "Q.36" of the Pew Research Center for the People and the Press's December 2005 News Interest Index (SRBI) asked "Now thinking about some groups and organizations… Is your overall opinion of [your state government] very favorable, mostly favorable, mostly unfavorable, or very unfavorable?"

[5] The missing states were early caucus or primary states in the 2008 presidential nomination process.

survey has data from roughly 1600 respondents from all 50 states. Respondents were also asked about how much they trusted state government.[6]

The October 2009 Hawkeye Poll sample approximately 800 respondents from 47 states. The survey was stratified by state in order to get reasonable sample sizes from small as well as large states. Sample size range from 9 respondents in New Jersey to 21 in a number of states. Respondents were randomly sampled within states. A number of questions regarding state level representation were included. Respondents were asked a unique pair of questions about the responsiveness of representatives and the state legislature. They were asked to state whether they strongly agree, agreed, disagree, or strongly disagreed with a set of statements. One statement was "My representatives in the state legislature are responsive to the desires and concerns of the people in my district," while a second was "The state legislature as a whole is responsive to the desires and concerns of the people in this state." Another question was asked about respondents' levels of trust in state government. A final battery of questions about constituent-legislator communication was asked of respondents. Questions asked included whether the respondent had contacted one of his or her state legislators and whether the respondent had met his or her legislator or a candidate for the legislature in person.[7]

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[6] Both Hawkeye Polls were conducted at the University of Iowa's Social Science Research Center (directed by Kevin Leight). The polls were directed by David Redlawsk and co-directed by Caroline Tolbert.

[7] It is important to note that the survey reports very high levels of political participation. 88% of respondents reported voting in the 2008 election, 46.5% of respondents reported contacting a representative in the legislature and almost 42% respondents said they had met a legislator or legislative candidate in person. These values are double the percentage of respondents who reported attending a rally or putting up a yard sign for state legislative candidates. Two things may be going on here. First, the sample does skew toward those who are likely to participate (the median age in the

The 2008 Cooperative Campaign Analysis Project is an 18,000+ respondent, six wave panel Internet survey conducted throughout 2008.[8] During the October panel, approximately 1000 respondents were asked to rate their level of trust in their state government from 0 to 100.[9] Finally, the 2008 Cooperative Congressional Election Study Common Content is a 32,000+ person Internet survey, conducted before the 2008 general election. One question in particular is useful for the purposes at hand. Respondents were asked "Do you approve of the way [the respondent's state's state legislature] is doing their job?" with the response categories of strongly approve, somewhat approve, somewhat disapprove, and strongly disapprove.[10]

These data offer some variation in questions asked. Three attitudes are measured: overall opinions, trust, and job approval. Questions are asked of both state government

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sample is 59). Second, the survey sampled small states where grassroots, interpersonal campaigning is much more common.

[8] Simon Jackman and Lynn Vavreck are the principle investigators of the project.

[9] The exact question wording is: "How much of the time can your state government be trusted to do what is right?" Respondents were given guidance that 100 indicated "All of the time," 75: "Most of the time," 50: "About half of the time," 25: "Seldom," and 0: "Never."

[10] Stephen Anolobehere is the principle investigator for the Common Content portion of the CCES. Both the CCAP and the CCES are online public opinion surveys which utilize survey matching techniques. The surveys were conducted by YouGov/Polimetrix. A two-stage sampling procedure was used for both surveys. In the first stage, a national random sample was drawn from the population. In the second stage, YouGov/Polimetrix used a matching algorithm to match the randomly –selected observations with very similar individuals already registered with the polling firm to take online surveys. The matching variables (for the CCES) were gender, age, education, income, race, marital status, church attendance, interest in politics, region, party identification, ideology, religious affiliation, voter registration, and metropolitan or non-metropolitan residence. The CCAP matching variables were gender, age, race, education, income, region, and state battleground status. After the sample was selected, survey weights were created to match the sample with aggregate Census data.

and the state legislature. Finally, trust in government is asked three different ways; any consistent finding across surveys should therefore be relatively robust.

4.2.2. Results: Bivariate Analysis

The first step is to examine the bivariate relationship between opinions about and trust in state government and legislative constituency size. If, as the theory presented here suggests, constituency size structures the interactions between representatives and constituents, influencing the amount and type of communication, the information learned by the constituent about the representative and vice-versa, and the transmission of policy preferences and political expectations from the constituent to the legislator, then as the district population grows, citizens should be less satisfied with the representation produced through the state legislature. We should expect responds residing in state with large constituency sizes to express less favorable evaluations of their legislature and government than respondents from states with small constituency sizes.

Table 4.1 is a first examination of this bivariate relationship. The table displays the mean response for each evaluation by quartile of constituency size in each state legislature's lower chamber. By and large, the mean comparison analysis conforms to expectations. In each column, there is a distinct downward trend in evaluations when moving from the top cell (smallest constituency size) to the bottom cell (largest constituency size). Four of the five datasets show the most positive evaluations coming from respondents living in states with the smallest constituency sizes, and in every dataset, the most negative responses come from residents living in states in the top quartile of constituency size.

The magnitude of the change in average evaluations by quartile is large. The larger surveys show the greatest effects of constituency size: favorable opinions decrease by over 12 percentage points moving from the first to the fourth quartile, while approval of the legislature decreases by roughly 10 points doing the same. Trust is more of a mixed bag, with the January/February Hawkeye Poll (Trust (a)) showing almost no change from the first to fourth quartile, a 7 point change in trust in the CCAP survey, and over a 10 point decrease evidenced in the October Hawkeye Poll. The variation of the effect on trust could be the result of a number of causes. Sample size differences might be important here, particularly with less certainty regarding the true mean evaluation in small states offering few respondents in the January/February Hawkeye Poll and the CCAP. Slight question-wording difference exit between the surveys, which may be influencing the extent to which the questions are tapping into a deep-seated perspective of legitimacy of government, rather than more transient evaluations of incumbents (A. H. Miller 1974; Citrin 1974; Cook and Gronke 2005).[11]

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[11] Measures of association tell a very similar story about the bivariate relationship between evaluations of state government and constituency size. The Somers'd_{yx} scores, a percent reduction in error (PRE) measure of association for ordinal data, lie in the 5-7 range, indicating knowing the constituency size from a respondent's state reduces the error in estimating whether a respondent has a positive evaluation of state government by approximately 6%. The measures of association are highly significant except in the January/February Hawkeye Poll. For the Pew, Hawkeye Poll, and CCES data, the Somers' d_{yx} measures are calculated using dichotomized versions of the evaluations of state government and lower chamber constituency size measured ordinally in quartiles. The exact results are as follows: -.058*** (Pew), .027 (Jan/Feb HP), -.060*** (Oct. HP), -.069*** (CCES). The Pearson's r correlation coefficient between 100pt. thermometer trust rating and the interval constituency size measure is -.123***. Stars denote statistical significance using two-tailed tests; * p<.1, ** p<.05, *** p<.01.

Table 4.2 repeats the mean comparison test, this time for the October 2009 Hawkeye Poll results. The findings for this survey are even stronger than those presented in Table 4.1. Trust drops steadily from 49% to 25.5% when moving from the first to fourth quartile. Slightly smaller results are found for the responsiveness items. The only item not to show a clear negative relationship with constituency size is contact: contact falls with the first three quartiles but increases with final quartile. Perhaps contact is tapping some other qualities, like mobilization or even anger and dissatisfaction with representation. Finally, respondents in states with small constituency sizes evince much higher rates of meeting their state legislators in person.

Another examination of the bivariate relationship between opinions and constituency size is presented in Figure 4.3 and 4.4. Presented in these graphs are the mean evaluations of state government by state in each of the six datasets plotted against constituency size. All evaluations are standardized by survey to ease comparison across surveys. The solid lines in the graph represent the fitted regression line from the simple regression of mean evaluations on constituency size. The effect of constituency size on aggregated evaluations of state government is clear from the figures. In all six datasets, there is a discernable, negative relationship between the two variables: higher constituency size is associated with worse evaluations. The first row of the graph presents the three trust datasets. The bottom row shows the favorable opinions and approval of the legislature data. The slope of the regression line for cells in the top row is shallower than those in the bottom row, indicating stronger scale effects on the presumably more transient items of favorable opinions of state government and approval of the legislature.

Figure 4.4 plots the mean evaluations and communication variables against constituency size. Again, the aggregated responses show a clear negative relationship between constituency size and evaluations of state government (trust), the state legislature (responsiveness), individual legislators (responsiveness), as well as having met legislators in person. These graphs give evidence of both the general relationship between district scale and representation, but also show constituency size decreases the probability constituents can have direct personal contact and communication with their legislator.

3.2.3. Developing the Model

Bivariate analyses largely confirm the research hypothesis at question here: namely, are evaluations of state government and the legislature more negative in states with higher constituency size? The bivariate statistics show an underlying negative relationship between evaluations and constituency size, but this analysis does not account for any number of factors, both among individuals and in the states they reside, that could influence the evaluations of state government. In what follows, I specify a model of state government evaluations. The model is then tested on all five datasets. The goal, of course, is to remove all variation in evaluations of state government coming from individual heterogeneity in the respondents selected and state heterogeneity in items other than constituency size, isolating this district characteristic's influence on a number of different evaluations of state government.

Individual-Level Predictors

Decades of political science research has identified factors which influence public opinion and political behavior of individuals concerning their relationship with

government. The central core of predictors is now standard in such research, as these predictors have repeatedly been found to correlate with a wide array of opinions and political activities. Age, educational attainment, and income have long been found to greatly influence opinions and behaviors of individuals (Lazarsfeld, Berelson, and Gaudet 1944; Verba and Nie 1972; Milbrath 1977; Jennings 1979; Wolfinger and Rosenstone 1980), as have gender, race, and ethnicity (Gay and Tate 1998; Shapiro and Mahajan 1986; Leighley and Nagler 1992; Rosenstone and Hansen 1993; Verba, Schlozman, and H. E. Brady 1995). Variables for each of these attributes are included in the model. Research has shown party identification to play a fundamental role in structuring how Americans view their political world, participate in politics, and incorporate political messages from opinion leaders (Campbell et al. 1960; Zaller 1992). To account for the role of party identification, I included two dichotomous variables, one each for respondents identifying with the Democratic and Republican parties.

In addition to these rather typical individual attributes, the model also includes a measure of electoral success for the individual. According to Anderson and Guillory, "people who voted for a governing party… are almost by definition more likely to believe that the government is interested in and responsive to their needs. They are inclined to be satisfied with the government's performance and with the way the system works" (1997, 68). This is in contrast to the opinions of those supporting losing political parties; the difference between the two sets of opinions has been termed "the winner-loser gap," and status as an electoral winner has been found to influence attitudes toward institutional change (Anderson et al. 2005; Bowler and Donovan 2007). Based on this research, a dichotomous variable measuring whether a respondent's political party

controls the policy-making process of the state government (governor's office and both chambers of the legislature) is included in the model.

State-level Predictors

The American states vary greatly on a wide number of factors, both social and political. In order to account for rival explanations for why some respondents give their state governments more positive evaluations than others, state-level factors are included in the model. The percentage of the state population that is black is included in the model, given the importance of racial diversity for state policy outcomes and the particular importance of race for politics in the South (Hero and Tolbert 1996; Key 1949).[12] States vary greatly in wealth as well, and affluence means higher revenue for the state and more resources which can be spent on any number of things citizens desire: education, social safety-net polices, and roads, just to name a few. Research has also linked state wealth with policy outputs (e.g. Dawson and Robinson 1963). To account for the potential difference between states in the types and quality of social policies enacted, state median income is a covariate in the model.

The American states, while boasting striking institutional similarities, differ politically in important ways which may influence public opinion in direct and indirect ways. First, institutional and political differences may *directly* result in better evaluations by citizens because citizens like the institution. Legislative term limits is an example. Term limits ballot propositions swept through initiative states during the 1990s, passing in the vast majority of initiative states. Respondents who live in states which have

[12] Percent Latino in the state is not included because of high collinearity with constituency size (r=.78).

enacted term limits may feel less cynical about who runs state government (Karp 1995). On the other hand, institutional and political differences may result in different policy outputs or alter legislative behavior. In this situation, the institutional or political characteristic works *indirectly* to influence opinions by causing some other change in the respondent's environment which in turn influences opinions on state government. Term limits could also be associated with opinion differences through this indirect mechanism, since the limits have been found to alter legislative behavior (Carey, Niemi, and Powell 1998).

Two legislative institutional characteristics are included in the model, based on the reasoning outlined above: whether the respondent's state has passed term limits, and the percentage of legislative districts that are multi-member, rather than single member, districts (Larimer 2005; Cooper 2008).[13] One political variable is used as an additional control: the presence of divided government in the respondent's state. Divided government may mean legislative gridlock (Bowling and Ferguson 2001; Alt and Lowry 1994), or it may lead to more centrist policies because of multiple veto players (Tsebelis 1995). At the very least, it should capture some aspect of party competition in the states.

The final state-level predictor included is the approval rating of the governor. The governor, as the most visible state political actor, certainly shapes opinions about state government. Further, as a key player in the policy-making process, the legislature is reliant upon the executive branch both for the passage of legislation and the implementation of it. It is therefore important to account for the variance in evaluations

[13] From (Larimer 2005). Larimer finds evidence that multimember districts influence welfare policies.

of state government as a whole due to actions of the governor. This variable should also pick up the general mood of the public, since approval of the governor is related to perceptions of state economic conditions (Atkeson and Partin 1995).[14]

What is left, of course, is the key independent variable in the model: legislative constituency size. My theory calls for a simple hypothesis: when comparing across individual respondents, those residing in states with large constituency sizes should have *less positive* evaluations of state government, the state legislature, and legislators than do those residing in states with small constituency sizes, holding all else constant and regardless of the specific type of evaluation. I also expect greater contact and communication with representatives when constituency size is small than when it is large.

Now that a group of standard regressors has been defined, the modeling can be addressed in greater detail. First, as mentioned earlier, a series of evaluations about state government have been collected. In five of the datasets, these evaluations are four-point ordinal scales. As in the results presented earlier, these scales are collapsed into simple dichotomous measures of the evaluations, where positive evaluations are coded as 1, and

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[14] The governor approval rating used is a result of the aggregation of responses to a question from the 2008 Cooperative Congressional Election Study. The question exactly mirrors the one used here on approval of state legislatures. Due to the CCES's large sample sizes within states, these aggregate responses make a suitable measure of state governor approval in 2008. As a check on the validity of the measure, a series of governor approval ratings were collected from Rasmussen Reports surveys. Data were available from all states except four. The governor approval ratings from Rasmussen correlated with the aggregated CCES measure at .91, showing the CCES variable suitably measures governor approval. The CCES was conducted in 2008; therefore it was merged into the 2008 datasets. The pooled Pew surveys, however, do not fit that time frame. No governor approval measure was collected to match that dataset, and the variable is omitted from the models using the Pew data.

negative evaluations coded as 0.[15] Models using these datasets, then, utilize logistic regression. The other dataset (CCAP) offers a 100-point thermometer rating of trust in state government. Models using the CCAP data take advantage of this continuously measured dependent variable by using multivariate regression analysis.

One final note on the modeling techniques used: multilevel data cause particular statistical problems for regression analysis. First, and most importantly, the estimates of the standard errors of group-level covariates are biased downward (Steenbergen and Jones 2002). This is particularly troublesome for scholars of institutions or social context, since the statistical significance of group-level effects are of central importance. Not adjusting standard error estimates for multilevel data can lead to Type I errors: rejecting the null hypothesis that $\beta_{\text{group}} = 0$ when the null is, in fact, true. Further, multilevel data can lead to inefficient coefficient estimates in regression analysis as well as upwardly-biased standard errors for individual-level covariates.

The specific modeling framework, then, is a random intercept multilevel logistic regression for binary dependent variables, and random intercept multilevel regression for models using the CCAP data. By specifying a random intercept, I let the estimate of the intercept vary by state. This is a flexible modeling strategy that allows the random intercept to account for unmodeled *state* variation in the *individual* responses.

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[15] I collapse the measures for two reasons. First, Brant tests were conducted after estimating ordered logistic regressions using their four-point ordinal versions of the dependent variables. These tests show that the models did not meet the parallel regressions assumption, indicating that ordered logistic regression is an improper modeling technique for these data, while there is a clear theoretical break between the disagree and agree responses. Second, Stata 10's built-in multilevel modeling packages do not contain an ordered logistic routine; the other add-on program for Stata (GLLAMM) has difficulty reaching convergence for ordered logit models.

4.3.4. Results: Multilevel Models

Table 4.3 presents the results from the random intercept multilevel models for three trust in state government datasets. Of primary concern are the parameter estimates relating to constituency size. The first model, using the January/February 2008 Hawkeye Poll, shows marginally significant ($p<.065$) and negative relationship between constituency size and trust in state government. Stronger findings are presented in the second model, which uses the October 2008 Hawkeye Poll dataset. Again constituency size accounts for a significant amount of variation in trust in state government across individuals. The negative sign supports the causal story told here: larger constituency sizes lead to lower evaluations. Only in the third model does constituency size not reach statistical significance, although the sign of the coefficient is as expected.

Winning elections has the most consistent influence on trust in state government. This is not surprising: Miller, after all, bases his discussion of trust in government on the idea of perpetual democratic losers – those for whom "their sense of insufficient political influence implies a futility in bringing about desired social change or control through political efforts" that results in "basic discontent and political alienation" (1974, 951). In accordance with Anderson and Guillory's predictions, electoral winners clearly evidence more trust in their state government (1997). Somewhat surprisingly, once electoral winner is taken into account, no other individual-level predictor consistently accounts for variance in trust judgments.

Governor approval rating, as expected, is positively related to trust in all three datasets. This likely reflects the tendency for trust and approval ratings to move together as citizens respond to good times and good leadership with trust. Also, citizens may be

basing their trust judgments at least partially on their feelings about the most prominent state actor, the governor (Citrin 1974). Divided government, perhaps by producing policy closer to the median voter of the state, has a consistent positive influence on trust as well.

Table 4.4 presents the results for whether the respondent has a favorable opinion of state government and approval ratings of the state legislature. In both cases, constituency size is highly significant and negative, conforming to the expectations presented here. Individuals residing in states with larger constituency size, all other factors held constant, have lower approval of their state government and state legislature. Other variables perform similarly here as they did in the trust models: electoral winners are more likely to have a favorable opinion of state government and to approve of the legislature. Governor approval and divided government also seem to engender good will toward state institutions.

The results from the multilevel models show a good deal of evidence in support of my theory. In four of the five datasets analyzed, when comparing across respondents while holding many individual and state-level attributes constant, those residing in states with a high constituency size tended to voice lower evaluations of state government than did those from states with a low constituency size. This is in accordance with the expectations of the theory. If scale does constrain legislator behavior and influence the communication transmission between representatives and constituents in such a way that damages the representational relationship, such lower evaluations would be expected. But statistical significance does not imply a substantively meaningful relationship. The

theory states, after all, that scale concerns *structure* the types and quality of interactions between citizens and representatives on which their relationship is based.

To examine the substantive influence of constituency size on opinions of state government, Figure 4.4 presents the predicted probabilities that a hypothetical respondent expresses a positive evaluation (i.e. trusts state government, has a favorable opinion of state government, or approves of the state legislature) over the range of lower chamber constituency size while keeping all other covariates set to their mean or modal values. Increasing constituency size from its minimum value to its maximum value is associated with an approximately 15-20 point *decrease* in the probability of positively evaluating state government. Even higher estimates result from the favorable opinions model.[16]

Also displayed in Figure 4.4 are the impacts of the modeling strategy. Each panel in the figure shows the estimated random intercepts for each state. Included with these estimates are their 95% confidence intervals. For presentation purposes, these estimates are centered on the predicted probability of a positive evaluation, given each state's lower chamber constituency size. Clearly, the multilevel modeling strategy employed is more important for the favorable opinions and approval of the legislature models than for the two trust models, since the estimated intercepts are much larger for those two models. The first trust model, on the other hand, gives estimates of random state intercepts that hover next to the predicted probability curve, indicating very little variation in evaluations is being accounted for by adopting the multilevel modeling strategy. The

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[16] One potential reason for these large estimated effects from constituency size is the fact that the favorable opinions model did not include governor approval as a control. These surveys were conducted over an 8-year period between 1997 and 2005. I have not yet collected reliable approval ratings for each state in each year.

second trust model shows virtually no deviation in intercepts across the states at all. Fortunately, multilevel modeling is flexible enough to provide accurate parameter estimates both when random intercepts account for unmodeled between-state variation in the dependent variable *and* when it does not.

Minimum to maximum is not, perhaps, the best comparison for evaluating the substantive influence of constituency size. California is an obvious outlier with its constituency size of 450,000; no other state has a lower chamber constituency size over 200,000 persons per district. Perhaps a more fruitful strategy is to examine the difference in the predicted probability of positively evaluating state government while adjusting constituency size to meaningful values. A hypothetical respondent residing in a state with mean constituency size is approximately 2-3 percentage points less likely to express a positive evaluation of state government than a hypothetical respondent from a state with minimum constituency size. The difference in probabilities associated with moving from minimum constituency size to a constituency size equaling the mean plus one standard deviation is associated with a 5-6 point decrease.

Table 4.5 shows the results from the multilevel models using the 2009 Hawkeye Poll. The first column presents the trust in state government model, followed by the assessments of the responsiveness of the legislature and representatives in the other two columns. Again, the multilevel model results support the relationship uncovered in the bivariate analysis: constituency size is negative and significantly related to all three evaluations. The breadth of constituency size's effect is important: it is associated with variation in how respondents view their state government, legislative institutions, and individual politicians.

The substantive effect of constituency size in the models presented in Table 4.5 is quite large. Moving from the minimum value of constituency size (roughly 3,000 residents) to the mean constituency size (just under 60,000 persons per district) is associated with a 12 percentage point decrease in trust in state government. The same change in constituency size is also predicted to have a 9 percentage point decrease in the probability of saying the legislature is responsive to the state and a 4.6 point decrease in the predicted probability of saying representatives are responsive to the district. The same minimum to mean change in constituency size is also related to a 9.9 point decrease the probability of having met a legislator or legislative candidate in person.

These amount seems to be substantively meaningful; in fact, it should be of great concern to a number of states. Currently, only California crosses the 200,000 person per district threshold. According to U.S. Census predictions however, by 2030, Texas and Florida will both have constituency sizes of over 200,000 persons, and California's will be over 580,000. To put it differently, between 2000 and 2030, Texas' constituency size, if the state does not increase the size of its legislative chambers, is predicted to increase by 59,000 persons, Florida's by 86,000, and California's by 121,000. And it is not just the biggest of the big states that are affected: Arizona and Nevada are both expected to see very large increases in constituency size over the next 20 years (70,000 and 40,000, respectively). [17]

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[17] Population projections are from the U.S. Census Bureau and based off of the 2000 Decennial Census. Projections are available online at: http://www.census.gov/population/www/projections/projectionsagesex.html.

4.4 Rival Explanations

The evidence presented up to this point shows strong support for my assertion that constituency size may shape representation. Two rival explanations, however, seem particularly possible and worthy of consideration here: (1) legislative professionalism and (2) the small state effect. Reams of research on state politics has established the wide-ranging influence of legislative professionalism on institutional and policy outcomes, not to mention legislative behavior (e.g. Squire 1992; Berry, Berkman, and Schneiderman 2000; Carey, Niemi, and Powell 2000a). Unfortunately, legislative professionalism and constituency size are highly correlated (Pearson's r = .7). Both variables cannot be included in any of the models used here if either variable is to approach statistical significance. The research directly pertaining to legislative professionalism and representation is more troubling for my theory. Squire (1993) tests for the relationship between legislative professionalism and public opinion while accounting for constituency size. Squire finds no effect for constituency size on opinions, but identifies a negative relationship between professionalism and opinions. Interestingly, Squire also uncovers a significant relationship between both legislative professionalism and constituency size and contacting the respondent's state legislator or staffer.

How should we make sense of these findings? I suggest it is best to view constituency size as logically prior to legislative professionalism. Constituency size, as stated earlier, is best viewed as population size augmented by chamber size. Population size has been found to be a foundational determinant of legislative professionalism (Mooney 1995; King 2000). While it is beyond the scope of the work in this chapter, there is good reason to suspect that constituency size, as a more accurate measure of the

scale concerns placed upon legislators, better addresses the workload demands facing legislators than population does. And legislators respond to those demands by securing resources: time, compensation for their work, and most importantly, legislative staff. An important aspect of Squire's piece is the seemingly paradoxical findings: legislative professionalism leads to *increased* communication and *lower* opinion ratings. Perhaps communication with staff is not a substitute for direct interaction with a legislator. It is, then, entirely possible for some of constituency size's effects to work indirectly through legislative professionalism.

But perhaps the results presented here are caused by a small state effect in that respondents from small states evaluate officials differently than respondents from large states do. In this framework, small state status, not constituency size, is the cause of positive evaluations. If this were true, then constituency size should be associated with more positive evaluations of other political actors. The 2008 Cooperative Congressional Election Study offers a chance to test this rival explanation. It boasts a battery of questions on approval of political actors and institutions including the president, U.S. House members, Congress, the governor, and the state legislature. If the rival explanation is true, then constituency size should be equally related to assessments of all institutions/actors. If my causal argument is true, then the state legislature should see the greatest impact of constituency size, with maybe some spillover effects on attitudes toward the governor, given the governor's role in the policy process. Table 4.6 presents the coefficient and standard error estimates from multilevel logistic regressions using the full model specified earlier in each of the regressions.

The findings in Table 4.6 do not support a small state effect. No significant relationship is discovered between constituency size and presidential approval, Congressional approval, or House member approval. Not only are they insignificant, they are also incorrectly signed. Only governor approval and approval of the legislature have a negative relationship with state legislative constituency size. Constituency size is only significantly related to approval of the legislature, supporting my contention that constituency size is measuring scale concerns facing individual legislators that influence representation at the state level. Based on this evidence, respondents from small states do not appear to simply have more positive evaluations of all institutions and political actors.

4.5 Conclusion

The empirical evidence presented here supports the theory. Both bivariate and multivariate statistical analyses show low values of constituency size to be associated with positive evaluations of state government. This finding is relatively robust to the specific type of evaluation (political trust, approval ratings, opinions), the object of the evaluation (state government, state legislature, state legislators), and question wording. Constituency size is also significantly related to direct interaction with representatives or candidates for office, although no significant effect was uncovered for initiating contact with legislators. Further, the substantive effects related to constituency size represent meaningful differences in evaluations. These findings do not seem to be spurious and should not be written off as another effect of legislative professionalism or some sort of a small state effect. The evidence is clear: at the state level, constituency size has far reaching effects on citizen perceptions of the representation received and the representational relationship.

Table 4.1. Mean Comparison of Evaluations of State Government by Constituency Size Quartile

Quartile	Favorable Opinions[a]	Trust (a)[b]	Trust (b)[c]	Trust (c)[d]	Approval of Legislature[e]
1st	76.2	44.4	39.7	51.6	50.8
2nd	71.9	44.2	38.4	46.0	50.3
3rd	70.0	45.3	32.5	46.3	47.7
4th	64.8	43.1	29.1	44.3	40.96
N	(8791)	(1138)	(1640)	(861)	(24246)

Note: "N" is the number of observations in each survey. Quartiles of lower chamber constituency size are used. Nebraska respondents are excluded due to the state's unicameral legislature. The ordinal measures used in the second, third, fourth, and sixth columns were collapsed into dichotomous measures, where "1" is a positive evaluation and "0" is a negative evaluation, to ease interpretation. The fifth column is the mean response on a 100pt. feeling thermometer.

[a] Source: Five Pew Research Center surveys from 1997-2005 (pooled).

[b] Source: The University of Iowa Hawkeye Poll, January/February 2008.

[c] Source: The University of Iowa Hawkeye Poll, October 2008.

[d] Source: Cooperative Campaign Analysis Project, October 2008 wave.

[e] Source: Cooperative Congressional Election Study, October 2008 Pre-Election wave, Common Content.

Table 4.2. Mean Comparison of Evaluations and Communication Measures by Constituency Size Quartile, October 2009 Hawkeye Poll Data

Quartile	Trust	Responsiveness: Legislature	Responsiveness: Representative	Contact	Met in Person
1st	49.1	70.4	76.6	52.2	53.7
2nd	41.8	68.5	72.1	44.5	38.3
3rd	27.1	64.7	66.1	39.5	36.6
4th	25.5	56.1	64.4	48.6	36.8
N	(788)	(761)	(750)	(785)	(24246)

Note: "N" is the number of observations in each survey. Quartiles of lower chamber constituency size are used. Nebraska respondents are excluded due to the state's unicameral legislature. The ordinal measures used in the first, second, and third columns were collapsed into dichotomous measures, where "1" is a positive evaluation and "0" is a negative evaluation, to ease interpretation. Source is the October 2009 Hawkeye Poll.

Table 4.3. Determinants of Trust in State Government, Random Intercept Models

	Trust (a)		Trust (b)		Trust (c)	
	b	(s.e.)	b	(s.e.)	b	(s.e.)
State						
Constituency Size	-.002+	(.001)	-.002**	(.001)	-.011	(.017)
Governor Approval	3.302**	(.863)	1.928**	(.545)	21.344+	(10.927)
MMD Upper	.006	(.007)	-.001	(.007)	.131	(.129)
MMD Lower	-.008*	(.004)	-.002	(.003)	.054	(.046)
Term Limits	.431+	(.230)	.014	(.163)	-2.212	(3.062)
Divided Government	.417+	(.222)	.316+	(.165)	9.702**	(2.806)
Pct. Black	-.320	(1.030)	-.837	(.938)	-23.671	(15.232)
Median Income	.028**	(.014)	.018+	(.011)	-.076	(.204)
Individual						
Republican	-.376*	(.152)	-.348	(.302)	-2.000	(2.617)
Democrat			-.441	(.303)	5.139*	(2.542)
Electoral Winner	1.045**	(.233)	.773**	(.179)	17.564**	(2.033)
Male	-.014	(.145)	-.092	(.122)	-4.475**	(1.472)
Age	-.010*	(.005)	.004	(.004)	-.016	(.052)
Education	.012	(.052)	.065	(.046)	-1.507*	(.767)
Income	-.037	(.037)	.011	(.032)	-.088	(.234)
Black	-.430	(.316)	-.583+	(.303)	2.560	(2.848)
Latino			.332	(.257)	.231	(3.480)
Intercept	-2.990**	(1.006)	-2.936**	(.826)	38.967**	(14.649)
Random Effects						
Intercept	.021	(.041)	--	--	35.353	(18.465)
N	882		1347		828	
AIC	1174.395		1653.053		7360.828	

Note: Models in the first two columns are random intercept multilevel logistic regressions. The third model is a random intercept multilevel linear regression. Models were estimated using Stata 10 computer software. N is the number of observations. AIC is the Akaike Information Criterion. Democrat dropped in the model presented in the first column because the January/February Hawkeye Poll was conducted as a presidential nomination poll. "Pure" independents, since they would not be voting in the primaries, did not get additional questions

Source: Trust (a): January/February 2008 University of Iowa Hawkeye Poll. Trust (b): October 2008 University of Iowa Hawkeye Poll. Trust (c): 2008 Cooperative Campaign Analysis Project.

+ $p < .1$, * $p < .05$, ** $p < .01$, two-tailed test

Table 4.4. Determinants of Evaluations of State Government, Random Intercept Models

	Favorable Opinions		Approval of Legislature	
	b	(s.e.)	b	(s.e.)
State				
Constituency Size	-.003**	(.001)	-.002**	(.001)
Governor Approval	--		2.124**	(.298)
MMD Upper	.002	(.004)	-.000	(.002)
MMD Lower	.001	(.002)	-.000	(.001)
Term Limits	.190	(.120)	.127	(.088)
Divided Government	.218**	(.070)	.595**	(.077)
Pct. Black	.007	(.006)	-.963*	(.405)
Median Income	.020*	(.010)	-.004	(.006)
Individual				
Republican	.197**	(.066)	-.069	(.052)
Democrat	.093	(.065)	.189**	(.051)
Electoral Winner	.671**	(.086)	1.664**	(.042)
Male	-.145**	(.053)	-.375**	(.029)
Age	-.002	(.002)	-.006**	(.001)
Education	-.024	(.018)	-.041**	(.015)
Income	-.015	(.014)	-.012*	(.005)
Black	-.366**	(.089)	.264**	(.051)
Latino	.212+	(.111)	.173**	(.055)
Intercept	.186	(.464)	-1.050**	(.392)
Random Effects				
Intercept	.084	(.028)	.046	(.013)
N	7273		23660	
AIC	8724.553		29270.518	

Note: Models were estimated using Stata 10 computer software. N is the number of observations. AIC is the Akaike Information Criterion. Governor Approval is measured in 2008 only and so cannot apply to the Pew Research Center data. The Favorable Opinions model also included survey fixed effects to capture any difference between surveys in the pooled dataset. These fixed effects are omitted to save space.

Source: Favorable Opinions: Five pooled Pew Research Center surveys from 1997-2005. Approval of Legislature: 2008 Cooperative Congressional Election Study.

+ $p < .1$, * $p < .05$, ** $p < .01$, two-tailed test

Table 4.5. Determinants of Evaluations of State Government, Legislatures, and Legislators, Random Intercept Logistic Regressions

	Trust		Responsiveness			
			Legislature		Representative	
	b	(s.e.)	b	(s.e.)	b	(s.e.)
State						
Constituency Size	-.010**	(.003)	-.007**	(.002)	-.004*	(.002)
MMD Upper	-.008	(.007)	-.012*	(.005)	-.003	(.005)
MMD Lower	.008+	(.005)	-.003	(.004)	-.002	(.004)
Term Limits	-.077	(.290)	-.163	(.231)	.005	(.227)
Divided Government	.691*	(.295)	.392+	(.232)	.353	(.229)
Pct. Black	-.933	(1.382)	-.678	(1.116)	-1.843+	(1.069)
Median Income	-.000	(.000)	-.000	(.000)	-.000	(.000)
Individual						
Republican	-.366	(.317)	.427	(.297)	-.047	(.306)
Democrat	-.190	(.325)	.401	(.311)	.213	(.320)
Electoral Winner	.678**	(.251)	1.075**	(.253)	.671**	(.255)
Male	-.131	(.174)	.171	(.174)	-.082	(.178)
Age	-.003	(.006)	-.007	(.006)	-.003	(.006)
Education	.053	(.062)	-.035	(.062)	.075	(.063)
Income	.072	(.046)	.033	(.045)	.016	(.046)
Black	-.984	(.668)	.255	(.531)	.219	(.554)
Latino	.679	(.488)	1.446*	(.631)	.232	(.510)
Intercept	.583	(1.068)	1.555+	(.911)	1.621+	(.908)
Random Effects						
Intercept	.309	(.150)	.089	(.096)	.057	(.088)
N	705		692		680	
AIC	892.386		870.706		838.511	

Source: October 2009 Hawkeye Poll.

+ p < .1, * p < .05, ** p < .01, two-tailed test

Table 4.6. Contact with State Legislators and Legislative Candidates, Random Intercept Logistic Regressions

	Contacted Rep.		Met in Person	
	b	(s.e.)	b	(s.e.)
State				
Constituency Size	.001	(.002)	-.007**	(.002)
MMD Upper	.001	(.005)	-.005	(.005)
MMD Lower	.001	(.004)	.004	(.003)
Term Limits	-.263	(.227)	.041	(.217)
Divided Government	-.060	(.231)	.323	(.226)
Pct. Black	-.051	(1.078)	-.128	(1.046)
Median Income	-.000	(.000)	-.000	(.000)
Individual				
Republican	-.063	(.292)	-.013	(.291)
Democrat	-.439	(.305)	-.074	(.303)
Electoral Winner	.074	(.229)	.023	(.230)
Male	-.159	(.163)	.059	(.162)
Age	.014*	(.006)	.010+	(.006)
Education	.204**	(.058)	.059	(.058)
Income	.089*	(.042)	.135**	(.043)
Black	-.052	(.507)	.752	(.483)
Latino	-.097	(.456)	.067	(.485)
Intercept	-3.042**	(.905)	-2.391**	(.872)
Random Effects				
Intercept	.108	(.086)	.078	(.078)
N	708		707	
AIC	-465.940		-461.973	

Source: October 2009 Hawkeye Poll.

+ $p < .1$, * $p < .05$, ** $p < .01$, two-tailed test

Table 4.7. Constituency Size and Approval of U.S. Institutions/Actors

Object of Approval	b	(s.e.)	p
Bush	.0001	.0003	.797
Congress	.0003	.0002	.143
U.S. Representative	.0001	.0004	.899
Governor	-.0017	.0015	.245
Legislature	-.0028	.0008	.000

Note: Random intercept, multilevel logistic regression used. Results displayed are the coefficients, standard errors, and p-values of the regressions of approval of various U.S. institutions and political actors on lower chamber constituency size of state legislatures. The models used mirror those presented in Table 4.4, except governor approval was not included as a covariate in order to standardize the regressions across the dependent variables. Results for control variables are omitted from the table.

Source: 2008 Cooperative Congressional Election Study.

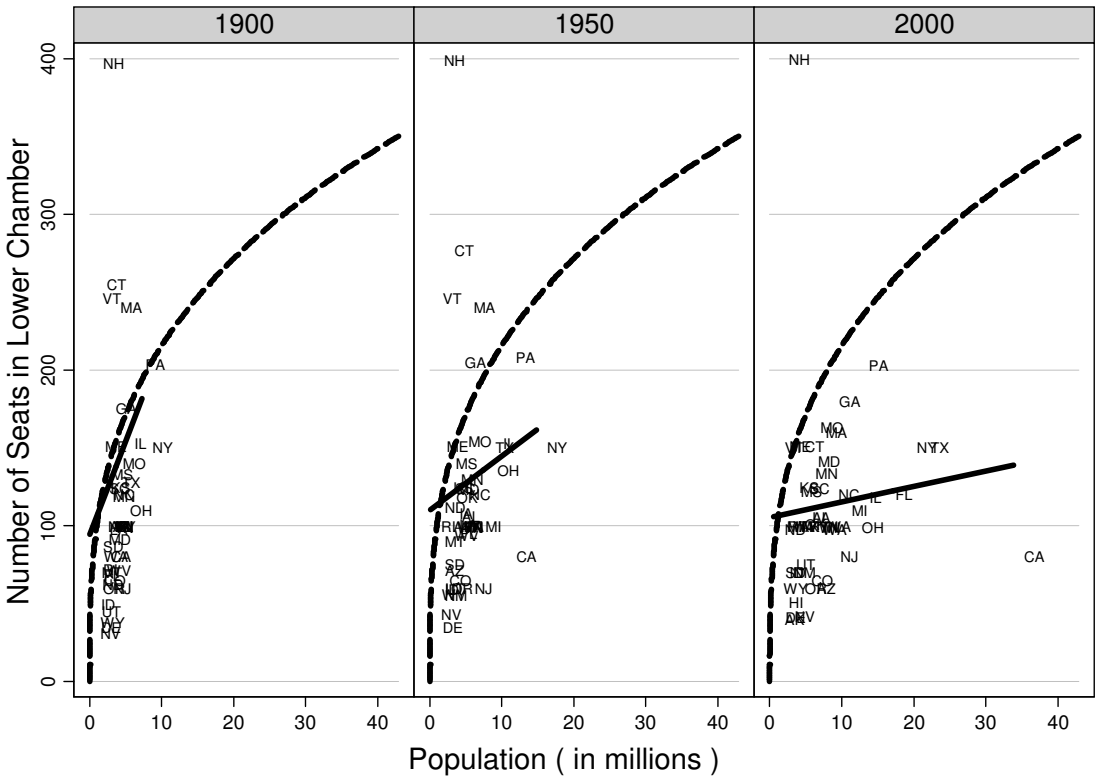

Figure 4.1. Size of Lower Chamber and State Population

Note: Graph displays the scatterplot of lower chamber size and population in the U.S. states. Solid line denotes the fitted linear regression line of chamber size regressed on population. The dashed lines represents Taagepera and Shugart's (1989) cubed root law, which states that the lower chamber size should equal the cubed root of the population.

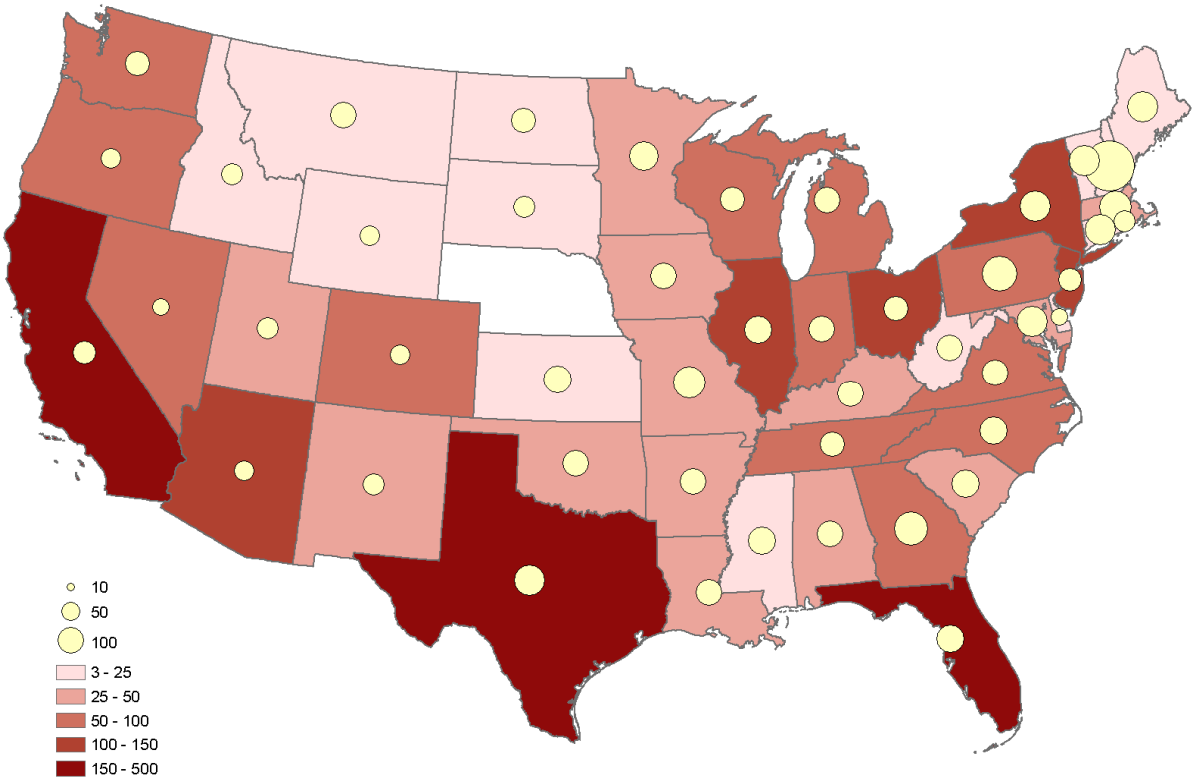

Figure 4.2. Constituency Size and Number of Seats in Lower Chamber, 2008

Note: Color gradation shows levels of constituency size (in thousands of residents) with darker colors showing higher values of constituency size. Yellow circles centered on the states are proportional to the number of seats in the state's lower chamber. Nebraska's unicameral legislature is omitted. Alaska has an estimated lower chamber constituency size of 17 thousand and a chamber size of 40 legislators. Hawaii's constituency size is 25 thousand with a chamber size of 51 lawmakers in the lower chamber.

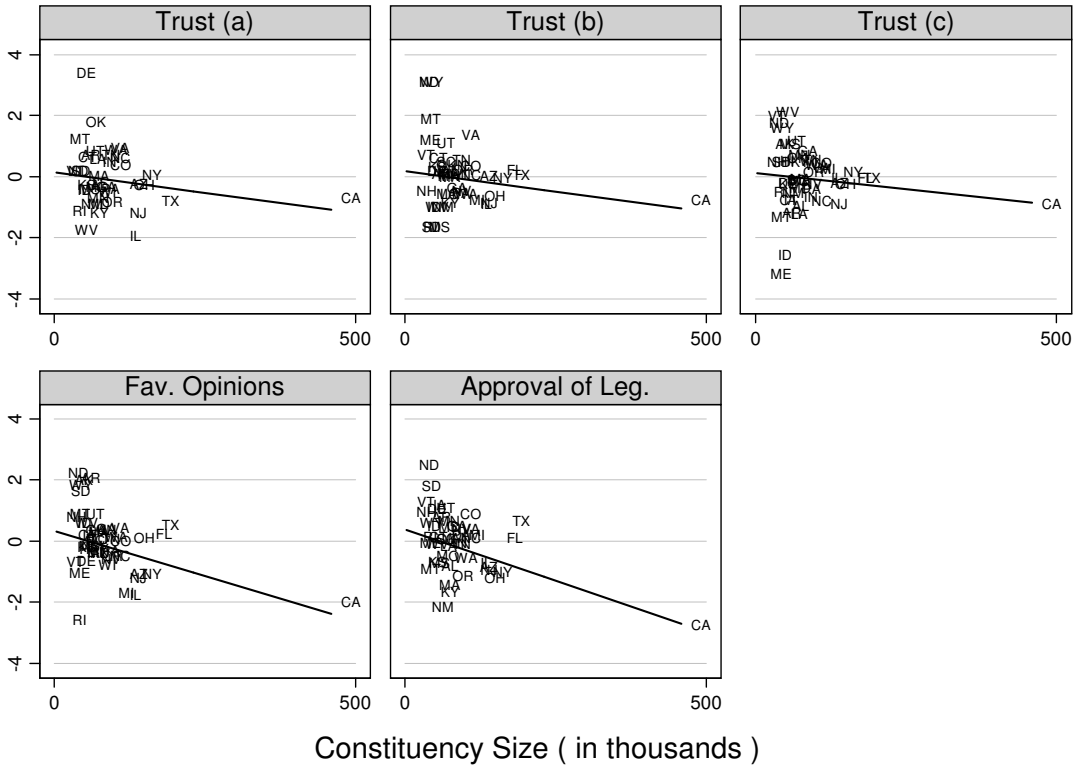

Figure 4.3. Plot of Standardized Evaluations of State Government and Constituency Size

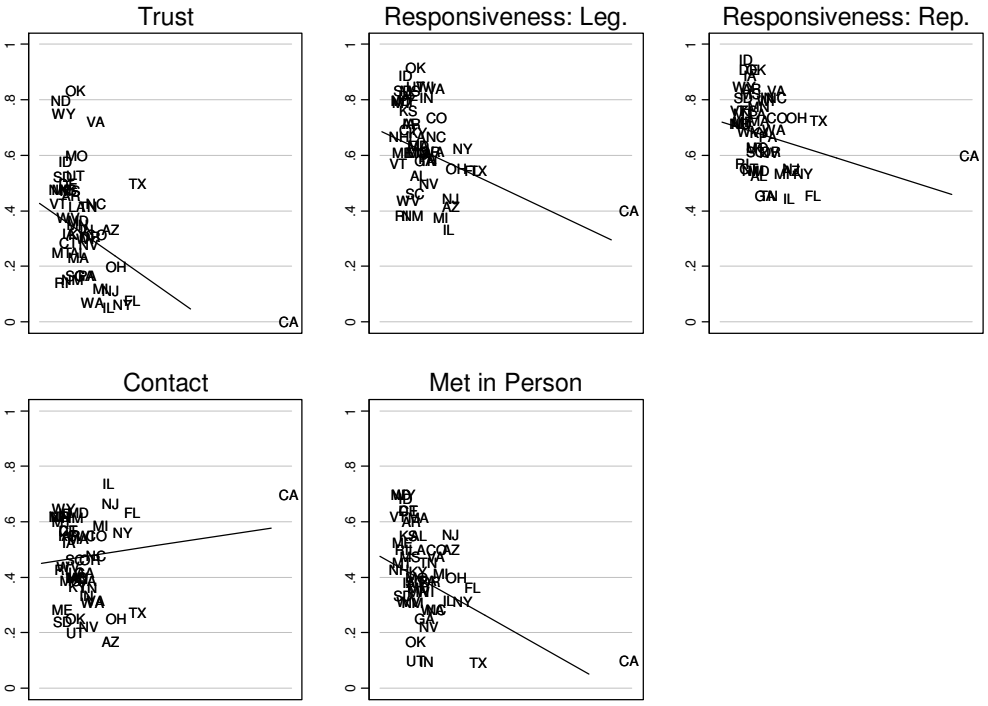

Figure 4.4. Plot of Evaluations and Communication Variables Against Constituency Size, 2009 Hawkeye Poll

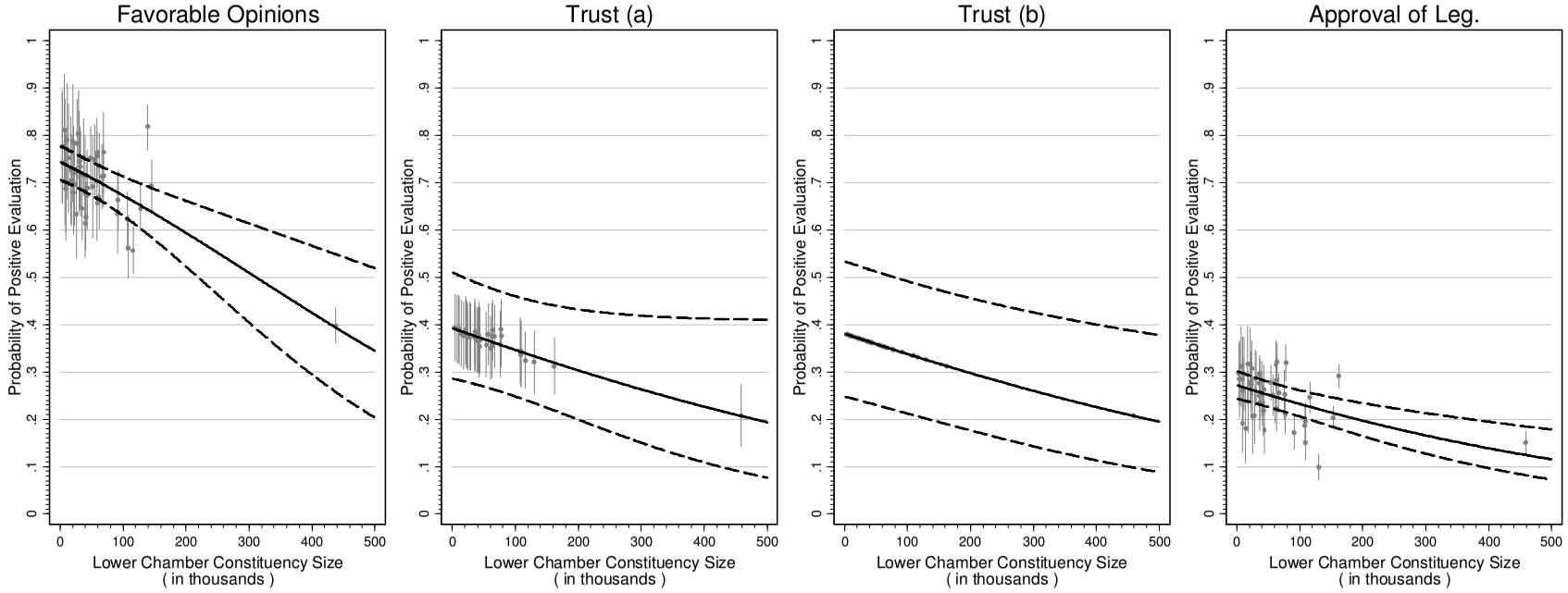

Figure 4.5. Predicted Probability of Positive Evaluation of State Government

Note: Figure presents estimated population-averaged predicted probabilities. Solid black lines are predicted probabilities across the range of lower chamber constituency size. Dashed lines represented 95% confidence intervals around those predictions for the *fixed* portion of the model only. The *random* portion of each model is represented by the gray points and bars: the points are the estimated (via maximum likelihood) random intercepts for each state. The gray bars denote a 95% confidence interval for the estimation of the random intercepts. Both the point estimates and the confidence intervals for each state are centered on the probability of a hypothetical respondent expressing a positive evaluation of state government, given the level of lower chamber constituency size of each state. Models used are presented in Tables 4.3 and 4.4. The hypothetical respondent represented in the predicted probabilities has all covariates set at their mean (for continuous variables) or modal (for dichotomous measures) values.

CHAPTER 5. DISTRICTING PRINCIPLES IN THE STATES

Stanley Lyson is a retired county sheriff from North Dakota, a member of the VFW, an Elk, and a Republican. Lyson was elected to his third term as state senator in 2006, winning 59% of the 3900 votes cast. His district, the 1st Senate district, encompasses the town of Williston in northwest North Dakota, a town of 12,500 residents, 94% of whom are white. Halfway across the country, Gilbert Cedillo represents California's 22nd Senate district. Cedillo, a Democrat and former General Manager of the SEIU in Los Angeles County, is serving his third term in the legislature, second in the Senate. Like Lyson, Cedillo easily won his 2006 reelection bid with 76.4% of the vote. The 22nd district covers downtown Los Angeles, along with the suburbs of Vernon, Maywood, Alhambra, San Marino, and South Pasadena, plus some smaller sections of other communities.

In many ways, Lyson and Cedillo face very different representational situations. California's 22nd Senate district is 73% Hispanic and all of Cedillo's constituents reside in urbanized areas. North Dakota's 1st district is 93% white, and all of Lyson's constituents live in rural areas. As discussed in the previous chapter, a large difference in the representational setting is due to constituency size: Cedillo has 850,000 constituents while Lyson has just over 13,000. Likewise, campaigning is more expensive in California than in North Dakota: Cedillo received approximately $500,000 in campaign contributions during the 2006 election cycle; Lyson received $5,900.[1] These differences

[1] According to the National Institute on Money in State Politics. Data available online at www.followthemoney.org.

should have predictable effects on the representational relationship, the policies pursued by Lyson and Cedillo, and the styles and strategies of campaigning.

California's 22nd Senate district and North Dakota's 1st differ in other, less obvious ways. The 1st is the most compact upper-chamber district in the country, while the 22nd is one of the least compact. Figure 5.1 displays maps of the two districts. The 22nd is clearly noncompact; the main body of the district is centered on downtown L.A., but extensions split off in every direction. A narrow stem connects the main body of the district to secondary area northeast of the city. North Dakota's 1st, in contrast, has simple boundaries, with most sections of the boundary relatively equidistant from the district's center.

The districts also differ in the degree to which their boundaries are coterminous with county or city boundaries. While much of California's 22nd district's boundaries cut through neighborhoods of Los Angeles, areas of its eastern borders fall along the city boundaries of Vernon, San Marino, South Pasadena, and Alhambra. Over a third of the district's boundaries follow city lines. The boundaries of Lyson's district, however, rarely match with those of Williston's. Only 17% of the 1st's boundaries overlap with county or city boundaries, a very low percentage for a rural district.

Does the shape California's 22nd district limit Cedillo's ability to campaign effectively? Does the lack of boundary coterminousness reduce constituent interaction with Lyson? This chapter begins to answer these questions by generating measures of compactness and coterminousness of state legislative districts across the 50 states, testing for the influence of districting principles on measures of the representational relationship,

and combining these findings with those of the previous chapter to get a unified view of the influence of district characteristics on representation in the states.

5.1 Districting Principles

What role do legislative districts play in shaping and structuring representation? Most scholarship and debate in American politics views districts as legislative institutions which provide the backdrop for state and federal legislative elections. As such, redistricting is thought to influence key components of the political system like the responsiveness of seat share in Congress or the state legislatures to changes in voting support for a given political party, the incumbency advantage, and the representation of minority interests.

With such important effects, it is not surprising that redistricting processes in the American states have been targeted for reform efforts by good government groups. For example, the League of Women Voters and Common Cause have endorsed redistricting reform as an essential democratic reform. Proponents of reform have actively pushed the issue during the 2000s through the initiative process, with recent victories in Arizona (2000) and California (2006) (McDonald 2008).

Many observers see an inherent conflict of interest in the redistricting process: in most states, redistricting is left to the state legislature or a commission consisting of partisan state political officials. Some state politicians, then, effectively draw their own district boundaries. In a 2006 editorial, the Los Angeles Times bemoaned this conflict and endorsed California's redistricting reform initiative, Proposition 11: "Voters are supposed to choose their representatives, but in California, political parties select their

voters. That kind of power is destructive and inherently anti-democratic. It must end, and Proposition 11 will help end it."[2]

Districting along racial lines has been equally chastised, this time from the courts. In the landmark case of *Shaw v. Reno* (1993), the Supreme Court found North Carolina's 12th congressional district unconstitutional because of a racial gerrymander. The district was so bizarrely shaped, argued Justice O'Connor in the majority opinion, race was obviously the over-riding factor in design of the district. Such gerrymanders, even when done in compliance with the Department of Justice and the Voting Rights Act (VRA) to increase the number of majority-minority districts, according to Justice O'Connor, questioned the political legitimacy of the districting system by conferring undue priority to race in matters of redistricting.

The Court in *Shaw* recommended the use of "traditional districting principles" to avoid the appearance of racial gerrymandering. Likewise, such principles have been advocated as a way to control partisan gerrymandering (e.g.D. D. Polsby and Popper 1993). Supposedly race- and party-neutral, these criteria have a long history of use in the U.S. Many criteria are categorized as traditional districting principles including contiguity, geographical compactness, respect for political subdivisions like counties or towns, respecting communities of interest (both racial/ethnic and nonracial/ethnic), nesting lower chamber districts within upper chamber districts, and district core preservation. Of these criteria, geographical compactness and respect for political

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[2] The Los Angeles Times. September 12, 2006. Editorial is available online at http://www.latimes.com/news/opinion/editorials/la-ed-endorsements12-2008sep12,0,4263507.story.

subdivision boundaries are the most prominent and have received the greatest attention from pundits, legal scholars, and political scientists.

Currently 34 states include drawing compact districts as a goal in redistricting in at least one chamber of the legislature. The vast majority of these states, however, do not specify how compactness should be measured or what would constitute noncompactness. Further, compactness requirements often stipulate the principle should be followed "when practicable" (Levitt 2008). Likewise, most states have requirements about the use of political subdivision boundaries in drawing districting boundaries, be it to not split up counties or towns in to multiple districts when possible, or to follow city and ward lines. 36 states contain some such requirement for at least one of their chambers.

While many claims have been made about districting principles, few have been empirically tested, with almost no tests conducted at the state legislative level. We know very little about how differences in districts themselves affect the political process. With the upcoming 2010 redistricting battles approaching, it is important to seriously consider how variation in the types of districts drawn might influence representation. This chapter aims to close this gap by examining two traditional districting principles - geographical compactness and coterminousness – on the representational relationship in the states.

Political representation in America is inextricably tied to geography. Territory-based districts group together certain citizens for representation based on geographical residence, defining a unique political community in the process. This community, the geographic constituency of the district (Fenno 1978), acts in electing legislators to represent its interests in the state or national legislature. Districts, their character and their delineation, play the important role in the American political system of defining the

geographical constituency and linking citizens to their representatives in the legislature. But to date, little research has examined the connection between district characteristics and this linkage, with particularly little research looking at traditional districting principles.

This chapter proceeds as follows: first, the relevant literature on redistricting is discussed, with particular attention given to recent evidence of the influence of districts on the constituents and legislators. Second, a description of state legislative districts across the U.S. on the generated measures of compactness and coterminousness is given. Finally, I test for the influence of redistricting criteria on the relationship between constituents and legislators. I find very little evidence that either compactness or respect for subdivisions influence broad evaluations of state government like trust in state government or the job approval of the legislature but do find that criteria matter for the dyadic relationship between constituents and their representative. Particularly, respondents from districts drawn over pre-existing political subdivision boundaries are more likely to say their state legislator is responsive to their interests and are more likely to report having met their representative in person.

5.2 Do Districts Matter?

Much academic research on redistricting has concluded that districts matter for representation – but they do so by operating through the typical and important conduits of partisanship and race. Districts and redistricting, by grouping together some citizens for representation, may influence the partisan and racial make-up of districts and, correspondingly, influence the distribution of seats won or winnable by political parties and underrepresented racial and ethnic minorities. A large literature has examined

whether redistricting increases the responsiveness of seat shares to public opinion or biases seat shares to favor one party or the other (Gelman and G. King 1994, 1990; Tufte 1973; Niemi and Simon Jackman 1991; Ansolabehere, D. Brady, and Fiorina 1992); (Abramowitz 1983), whether redistricting has reduced the number of competitive elections and resulted in a polarized Congress (Mayhew 1974); (Abramowitz, Alexander, and Gunning 2006; McDonald 2006; Murphy and Yoshinaka 2009; Schaffner, Wagner, Michael W., and Winburn, Jonathan 2004), and whether majority-minority districts damage black substantive representation by packing Democratic votes into a few districts (Cameron, Epstein, and O'Halloran 1996; Lublin 1999).

A growing number studies looks at how districts might affect the representational relationship. Recent work on redistricting shows incumbents do cultivate a relationship with constituents, thus they receive lower vote shares in areas of the district they did not represent prior to redistricting (Ansolabehere, D. Brady, and Fiorina 1992; Desposato and Petrocik 2003) resulting in more political competition in those new areas of the district (Crespin 2005). Further, disrupting the representational linkage between legislators and constituents by moving residents out of one district and into another reduces the amount of information residents know about their new incumbents (McKee 2008a), reduces the probability residents in new parts of the district will turnout on Election Day (D. Hayes and McKee 2009), and influences candidate choice (McKee 2008b).

Redistricting affects the legislator side of the equation as well. U.S. House members are generally responsive to changes in their district. Glazer and Robbins (1985) find in the 1972 and 1982 elections that Democratic House incumbents were particularly responsive to constituency changes to the left in their district, while Republicans were

responsive to movements to the right. Boatright (2004) and Stratmann (2000) find similar results. Hayes, Hibbing and Sulkin (2010) uncover evidence of a more specific effect: legislators change their sponsorship and co-sponsorship behavior to address a change in constituency by tailoring their sponsorship activities to issues of direct concern to the new constituents. Crespin (Forthcoming) augments these results by arguing members of Congress are only responsive on votes visible to constituents rather than procedural ones.

Such evidence provides excellent support for the contention that districts influence representation. Redistricting interrupts the representational relationship, changing incentives for representatives. Both residents and legislators respond predictably. But this literature treats redistricting as a one-dimensional issue: residents are either new to the district, or they are not. However, the sorts of districts drawn in redistricting may have their own effects. In other words, do certain types of districts foster a closer linkage between constituents and representatives? Do some districts discourage communication with legislators while other districts encourage it?

5.3 Empirical Studies of Districting Principles

Almost all states stipulate some districting principles that should be used during redistricting, like compactness and respect for political subdivisions. However, only a handful of empirical studies have examined the relationship between such districting criteria and any aspect of representation. The current state of empirical studies on these districting principles is mixed, at best.

5.3.1 Compactness

While the most important district criterion in legal circles (see D. D. Polsby and Popper 1993) , few studies have examined compactness' political effects. The geographic

principle is usually seen primarily as a constraint on political gerrymandering, although Altman's work (1998b) challenges the extent to which compactness standards successfully limit line drawers. The Supreme Court initially drew attention to compactness in *Shaw v. Reno* by suggesting drawing compact districts would relieve states from claims of racial gerrymandering, which the Court found unconstitutional. Racial gerrymanders send insidious messages to voters, according to the Court, about race and representation: namely, that all members of racial groups think and act alike. Thus racial gerrymanders may cause "expressive harms" to citizens (Pildes and Niemi 1993). Yet the search for such harms has turned up little evidence of any compactness effect at all. Altman (1998a) finds no effect of compactness on trust in government (using the American National Election Study). He does, however, find a significant relationship between compactness and turnout, with more compact districts seeing higher turnout. Engstrom (2000) sees a similar finding in one study but not in a later one (2005). Further, empirical studies have concluded that compactness standards decrease the number of majority-minority districts in states and do not limit incumbent protection during redistricting (Barabas and Jerit 2004; Forgette and Platt 2005). Each one of these studies has looked at compactness in the context of U.S. congressional districts.

5.3.2 Coterminousness

The evidence on boundary overlap is a little stronger. Winburn (2009), in a study of redistricting in eight states after the 2000 Census, argues that respect for political subdivisions played an important role in limiting political gerrymandering. Forgette and Platte (2005) find evidence that laws requiring redistricting authorities to respect political boundaries reduce the vote share of incumbents House of Representatives members, thus

reducing incumbent protection. Further, three studies have examined district-county congruence at the congressional level and the findings largely support the notion that districts which are congruent with counties lead to positive democratic outcomes like better recall of the names of House members (Niemi, Powell, and Bicknell 1986; Engstrom 2005; Winburn and Wagner Forthcoming), although these effects might be smaller than for district-media market congruence.

To date, only Winburn's comparative study of eight legislatures has examined either districting principle in the context of state legislative districts. This project fills that gap by providing measures compactness and coterminousness at the district level of all state legislative chambers in the U.S. states gathered using geographic information systems (GIS). These data were merged with public opinion data on the various evaluations of representatives, institutions, and state government along with contact and political activism measures at the state level.

As stated in Chapter 3, compactness and coterminousness, by fostering their own elements of homogeneity (geographic and community-based) should help unify interests within the district, making representation easier. More importantly, both compactness and coterminousness reduce information costs associated with placing oneself within the system of districts, which should influence the degree of constituent-legislator communication and interaction. The causal direction is clear: greater compactness and greater coterminousness should be associated with more positive evaluations of representatives, institutions and government because citizens' desires are more effectively translated into public policy, and greater constituent-legislator communication.

5.4 Describing State Legislative Districts

Histograms of the geographical compactness scores and the boundary coterminousness scores are presented in Figure 5.2. Both variables are approximate normal distributions at the lower chamber level, with compactness showing a slight positive skew. Coterminousness deviates from normality largely in the number of districts which show no overlap with political subdivision boundaries. Upper chamber coterminous scores display a different pattern; upper chamber districts are clearly more coterminous than lower chamber boundaries. Lower chamber districts have an average coterminous score of .47, while upper chamber districts have an average score of .58.

States, due to their different geographical and social differences, as well as the relative importance they place on traditional districting principles, differ in the extent to which they draw compact and coterminous districts. Table 5.1 shows the mean and standard deviation of compactness and coterminous scores (lower chamber districts) by state. The table shows substantial cross-state variation on the items as well as within-state variation. The compactness and coterminousness are mildly related to one another at the district level ($r=.16$, $p<.05$ two-tailed), but the relationship weakens when analyzing state districting plans (mean compactness and mean coterminousness for lower chamber districting plans: $r=.03$, insignificant).

Maps of state legislative districts coded by their values of compactness and coterminousness scores are presented in Figures 5.3 through 5.6. Figures 5.3 and 5.4 show the compactness scores and the final two figures show coterminousness scores. In Figures 5.3 and 5.5, the top map displays lower chamber districts and the bottom map

shows upper chamber districts. Figure 5.4 and 5.6 zoom in on the eastern half of the U.S. to better illustrate the scores in small districts.

Several geographic patterns are evident in these figures. First, geography constrains compactness scores, particularly among lower chamber districts. Coastal districts with noncompact geographic features, like the Texas Gulf coast, North Carolina, Alaska's Aleutian Islands and Alexander Archipelago, the Chesapeake Bay area, and southeastern Louisiana, have necessarily low compactness scores. Second, plain states boast greater compactness and coterminousness. These high scores, driven by the frequent use of counties as building blocks of districts, are due to a large number of compact counties in Midwestern and Great Plains states. The importance of counties is highlighted by Tennessee and Kentucky. These states (shown in Figure 5.5) have very high overlap between upper chamber legislative districts and counties, but have low compactness scores (Figure 5.3). In other words, following county boundaries leads to more compact districts in some states then in others.

Third, urbanism reduces coterminousness – large urban areas like Chicago and the Boston-Washington megalopolis tend to few highly coterminous districts. Fourth, the number of legislative districts relative to the state size also influences compactness and coterminousness. New England states tend to have large lower chambers but small states, both in terms of geographic and population size. Vermont and New Hampshire, for example, have many small, compact lower chamber districts. These districts, however, are too small to effectively follow county and city boundaries – thus both Vermont and New Hampshire have relatively high compactness scores but low coterminousness scores in the lower chamber.

Perhaps the most important element in the figures the diversity compactness and coterminousness scores. Every state in the country has compact and noncompact districts at least in the lower chamber. The same is true for coterminousness. Even though redistricting regulation and process is constant within states, large and important intra-state variation exists on both geographic districting principles. Yet inter-state variation matters as well; state borders are particularly clear in the coterminousness maps.

5.5 Data

Unfortunately the same data issues discussed in the previous chapter are obstacles here as well. Very few surveys contain questions on evaluations of state government or (even more rare) state legislators. Virtually no publicly available surveys ask respondents about contact with or knowledge of their representatives in the state legislature. The analyses here are limited to the surveys used in Chapter 4. Evaluations include a battery of questions on trust in state government from four different surveys, a question on whether respondents have a favorable opinion of state government, job approval of the state legislature, and responsiveness of the legislature and the representative to the desires and concerns of the district's residents. The October 2009 Hawkeye Poll contains a number of communication and participation questions including whether the respondent had contacted one of his or her state representatives, and whether the respondent had met a representative in person.

Since none of the surveys contain state legislative district identifiers, respondent reported zip codes were used to identify each respondent's legislative districts. In situations where more than one legislative district (per chamber) was associated with the zip code, census blocks weighted by their 2000 population were used to estimate the most

likely district of residence.[3] Only one of the Pew Research Center polls contains zip codes necessary to identify respondents' legislative districts and occurred after the 2002 election, so the analyses using the Pew data are limited to the one survey.

5.6 Bivariate Relationships

Are districting criteria related to more positive evaluations of state legislators and state government and/or greater communication between constituents and legislators? The relationship between values of compactness and coterminousness and evaluations is presented in Table 5.2. The table shows the mean value of the dependent variable (evaluation) by levels of the district characteristics.

Some marginal support for the theory is found in the. The percentage of respondents saying they trusted state government rises along with compactness in all four trust surveys, although the increase is small in the October 2008 Hawkeye Poll and the 2008 CCAP. Larger changes (7 percentage point increases) are found in the January/February Hawkeye Poll and the October 2009 Hawkeye Poll. Slightly weaker results exist for the other institutional evaluations. Moving from the lowest to the highest category of compactness is associated with a five point increase in the percent of respondents who hold a favorable opinion of state government and a three point increase in the percent of respondents approving of the legislature and feeling the legislature is

[3] Zip Code Tabulation Areas (ZCTAs) were used to match zip codes to legislative districts. ZCTAs do not exactly match zip codes; the Census Bureau created ZCTAs as aggregations of block groups that approximate zip code locations after the 2000 Census. Zip codes do not have formal boundaries and no demographic data is tabulated by the Census Bureau at that level. Zip codes also are in constant flux, with the U.S. Post Office creating new zip codes and shifting areas of old ones as needed during the decade. The method used here thus suffers from some measurement error. ZCTA to state legislative district relationship files were created using MABLE\Geocorr2k program from the Missouri State Data Center, available online at http://mcdc.missouri.edu/websas/geocorr2k.html.

responsive. In all, the compactness results are consistently positive but of somewhat small magnitude.

Coterminousness, however, appears to be negatively related to positive evaluations of the legislature and state government. Moving from the lowest category of coterminousness to the highest is associated with an increase in trust in only one dataset. Coterminousness is also positively related to saying the legislature is responsive to the respondent's state. The overall story, however, is one of weak, negative relationship between institutional evaluations and coterminousness.

Table 5.3, however, shows a different picture. All of the data in the table are from the 2009 Hawkeye Poll, which oversampled respondents from small states. These data also measure dyadic representation and linkage, with the questions concerning the responsiveness of the respondents' legislators and communication with legislators, and political activism during legislative campaigns. In this table, compactness is positively related the three items. The magnitude of these relationships, however, is smaller than those found in Table 5.2. Larger effects are found for coterminousness. Respondents from districts with greater coterminousness clearly view their legislators as more responsive, have higher levels of contact, and are more likely to report meeting their representatives in person.

5.7 Multivariate Analyses

These bivariate relationships are tested by a series of multilevel logistic regressions presented in Tables 5.4, 5.5, and 5.6. These models are identical to the ones presented in Chapter 4 except they include the compactness and coterminousness scores of the respondent's lower chamber district as well as the percent of the district

categorized as urban by the Census Bureau. To account for other possible influences on the dependent variables, I included measures of basic individual-level demographic variables of gender, race, age, education and income. Partisanship was included through dichotomous indicator variables for Republicans and Democrats along with an electoral winner term, denoting whether the respondent's party controlled both the governorship and the two chambers of the legislature. Aggregate variables of average constituency size of lower chamber districts, percent black in the state, the percentage of districts at the upper and lower chamber levels that are multimember districts (Larimer 2005), whether the state as enacted term limits, and governor approval (for 2008 data) is controlled for in the models. Based on the findings of Chapter 4, constituency size is critically important variable to include in the models. Urbanism is clearly important from the maps presented earlier: coterminousness is negatively related to percent urban (r= -.37).

The multilevel models largely confirm the bivariate analysis. Districting principles do not appear to be driving trust in state government. While the coefficient for compactness is positive in all but one trust model, it never reaches traditional levels of statistical significance. As in the bivariate relationships, coterminousness is negatively signed in all but one trust model, but again, the relationships are not statistically significant.

Table 5.5 shows the multilevel modeling results for the non-trust evaluation models. Similar results are shown for the evaluations of state government and the state legislature. Regardless of the survey and the specific attitude tapped, coterminous is not significantly related to evaluations of government or the legislature. The same is true for respondent's compactness scores. The final model in Table 5.5 displays the findings from

the regression of respondent's assessments of their representatives' responsiveness to the desires of their constituents on the full set of covariates. Here, finally, is evidence of a districting principle effect. Respondents living in districts with higher coterminousness scores are significantly more likely to report believing their representatives are responsive to district concerns. Compactness is not significantly related to the responsiveness evaluations. Substantively, a change from one standard deviation below the mean of coterminousness (36% of the district's boundaries overlap with other boundaries) to one standard deviation above the mean (59% of boundaries overlap) results in a 4 percentage point increase in the probability a hypothetical respondent considers her representatives responsive to the desires and concerns of her district. A minimum to maximum change is associated with a large 18 percentage point increase in predicted probability. Such effects are substantively meaningful, and give support to the theoretical argument presented earlier that respecting political boundaries when drawing districts may make representation easier by unifying constituents who share common local interests in the same district.

Table 5.6 show two communication-related models. The first models whether respondents have contacted one of their representatives in the state legislature. The second looks at whether respondents have met a representative or a candidate for the legislature in person. Somewhat surprisingly, neither districting principle significantly influences contact with a state legislator, although both compactness and coterminousness are signed according to expectations (positive). Higher coterminousness is, however, significantly associated with meeting a representative or a legislative

candidate in person. Again, compactness is not significantly associated with meeting a representative.

Coterminousness has a similar substantive impact on the probability of meeting a representative in person as it has evaluations of legislator responsiveness. A one standard deviation below the mean to one standard deviation above the mean increase on coterminousness is associated with a 4.6 percentage point increase the probability of having met your state legislator (or candidate) in person. The model predicts that increasing coterminousness across the full range of its values leads to a 20 percentage point increase in the probability a hypothetical respondent has met her representative in person.

So far the focus has been on the findings pertaining to geographic districting principles, but it is important to note the role constituency size in these models as well. The results here match closely with the results presented in Chapter 4: high constituency size is significantly associated with less trust in state government (significant in two of four datasets), lower approval of the legislature, less favorable opinions of state government, lower evaluations of the responsiveness of both the legislature as a whole and respondents' individual representatives, and less interpersonal interaction with representative and/or legislative candidates. These relationships hold even when accounting for district-level urbanism and characteristics of district boundaries.

5.8 Discussion

Despite widespread attention given to geographical compactness, I find no significant relationship between compactness and any of the dependent variables shown here. Coterminousness, on the other hand, does seem to have an effect. This effect

manifests itself in dyadic representation: respondents from coterminous districts are more likely to say their representatives are responsive to their desires and concerns and are more likely to have met their representatives or legislative candidates in person than are respondents from districts with un-coterminous boundaries. But there does not appear to be any spillover effects to approval of the legislature or trust in state government. In other words, coterminousness influences the legislator-constituent linkage but not in such a way that leads to more positive assessments of the representational system in the states or the legislature as a whole.

In stark contrast to districting principles, constituency size does have just that sort of an influence. Nearly every item tested at the state level showed an effect for constituency size and in the predicted direction. Further, constituency size does influence the type of citizen-legislator interaction at the state legislative level. While I do not find evidence that a growing constituency reduces citizen-initiated contact, there is strong evidence that constituency size alters the kind of interact available: in states with high constituency sizes, most constituents simply cannot engage in face-to-face interaction with their elected representatives. Such interaction is possible when constituency size is small.

The evidence presented in this chapter also underscores the need for better survey data on the relationship between individuals and their representatives in the state legislature. The influence of districting principles appears to be on constituent-legislator interaction, the scarcity of survey questions regarding this interaction makes it impossible at this time to corroborate this finding on another data source.

Table 5.1. Compactness and Coterminousness Scores, Lower Chamber Districts, by State

State	Compactness		Coterminousness		State	Compactness		Coterminousness	
	Mean	S.D.	Mean	S.D.		Mean	S.D.	Mean	S.D.
AL	.26	.12	.49	.22	MT	.32	.09	.41	.25
AK	.34	.18	.42	.33	NV	.28	.10	.29	.25
AZ	.31	.11	.46	.22	NH	.46	.14	.45	.25
AR	.33	.12	.52	.23	NJ	.27	.09	.77	.14
CA	.22	.08	.56	.20	NM	.31	.12	.32	.22
CO	.33	.13	.58	.23	NY	.28	.12	.46	.22
CT	.39	.12	.40	.17	NC	.32	.12	.53	.23
DE	.40	.10	.29	.17	ND	.44	.13	.49	.28
FL	.23	.10	.43	.17	OH	.30	.16	.70	.18
GA	.31	.10	.48	.22	OK	.39	.12	.44	.22
HI	.35	.11	.32	.22	OR	.32	.09	.43	.21
ID	.37	.12	.65	.28	PA	.28	.12	.49	.19
IL	.34	.12	.41	.18	RI	.39	.12	.37	.19
IN	.27	.11	.42	.18	SC	.31	.10	.43	.20
IA	.40	.13	.62	.18	SD	.40	.15	.68	.26
KS	.40	.13	.52	.24	TN	.22	.10	.55	.28
KY	.23	.11	.58	.24	TX	.29	.13	.57	.31
LA	.26	.10	.46	.22	UT	.35	.11	.46	.21
ME	.36	.16	.39	.21	VT	.49	.14	.39	.18
MD	.22	.13	.39	.15	VA	.26	.09	.52	.21
MA	.29	.14	.40	.20	WA	.33	.11	.57	.19
MI	.42	.16	.69	.23	WV	.31	.11	.63	.18
MN	.42	.11	.62	.19	WI	.29	.12	.54	.17
MS	.19	.10	.34	.16	WY	.32	.12	.48	.21

Source: Author's calculation based on Census Bureau 2006 generalized cartographic boundary files.

Table 5.2. Mean Comparison Analysis of District Principles and Institutional Evaluations

	Trust in State Government				Favorable	Approval	Responsiveness
Compactness	Jan./Feb '08	Oct.'08	CCAP	Oct.'09	Opinion	of Leg.	of Legislature
< .249	.41	.30	.43	.36	.64	.43	.67
.25 - .49	.46	.33	.46	.36	.62	.45	.64
> .5	.48	.31	.46	.43	.69	.46	.70
Max - min	.07	.01	.03	.07	.05	.03	.03
Coterminousness							
< .349	.44	.32	.46	.35	.71	.47	.62
.35 - .649	.45	.34	.45	.37	.63	.44	.64
> .65	.43	.28	.44	.39	.58	.43	.70
Max - min	-.01	-.04	-.02	.04	-.13	-.04	.08
N	1105	1506	863	714	1366	25042	698

Sources: Three trust measures from various University of Iowa Hawkeye Polls. The other trust question is from the 2008 Cooperative Campaign Analysis Project. Approval of legislature data are from the 2008 Cooperative Congressional Election Study. Responsiveness of legislature question was asked in the October 2009 University of Iowa Hawkeye Poll. The Oct. '09 poll was stratified by state, with random samples within states of registered voters.

Table 5.3. Mean Comparison Analysis of District Principles and Dyadic Linkage Items

Compactness	Responsiveness of Legislator	Contacted Legislator	Met in Person
< .249	.70	.47	.43
.25 - .49	.69	.47	.43
> .5	.71	.53	.45
Max -min	.01	.06	.02
Coterminousness			
< .349	.62	.43	.36
.35 - .649	.71	.50	.46
> .65	.75	.49	.47
Max - min	.13	.06	.11
N	688	716	716

Source: October 2009 University of Iowa Hawkeye Poll. All items ask about relationship with state legislators. District characteristics measured at the lower chamber district level. Alaska, Hawaii and Nebraska not sampled.

Table 5.4. Districting Principles and Trust in State Government, Multilevel Logistic or Linear Regressions

	Hawkeye Poll Jan./Feb. 2008		Hawkeye Poll Oct. 2008		CCAP		Hawkeye Poll Oct. 2009	
	b	(s.e.)	b	(s.e.)	b	(s.e.)	b	(s.e.)
Aggregate								
Coterminous	-.140	(.366)	-.389	(.306)	-2.268	(3.751)	.463	(.442)
Compact	.820	(.604)	.013	(.531)	9.328	(6.519)	-.172	(.693)
Pct. Urban	-.082	(.216)	-.420*	(.190)	.791	(2.340)	-.060	(.248)
Constituency Size	-.001	(.001)	-.002*	(.001)	-.009	(.017)	-.011**	(.004)
Gov. Approval	3.476**	(.884)	1.903**	(.561)	18.662+	(11.209)		
MMD Upper	.002	(.008)	.001	(.008)	.119	(.141)	-.009	(.007)
MMD Lower	-.007	(.004)	.001	(.003)	.052	(.048)	.009+	(.005)
Term Limits	.406+	(.231)	.059	(.169)	-2.915	(3.036)	-.093	(.310)
Divided Gov.	.369	(.225)	.271	(.171)	9.170**	(2.836)	.628*	(.313)
Pct. Black	-.150	(1.067)	-.877	(.976)	-20.035	(15.462)	-.635	(1.482)
Median Income	.026+	(.014)	.021+	(.011)	-.036	(2.154)	-.026	(.019)
Individual								
Republican	-.371*	(.155)	-.361	(.314)	-.996	(2.720)	-.314	(.326)
Democrat			-.475	(.316)	5.721*	(2.653)	-.143	(.334)
Electoral Winner	1.007**	(.236)	.779**	(.187)	17.245**	(2.170)	.572*	(.261)
Male	-.045	(.147)	-.113	(.127)	-4.045**	(1.541)	-.127	(.180)
Age	-.009*	(.005)	.006	(.004)	-.013	(.055)	-.004	(.006)
Education	.012	(.053)	.068	(.048)	-1.516+	(.817)	.066	(.065)
Income	-.043	(.038)	.025	(.034)	-.075	(.245)	.082+	(.047)
Black	-.433	(.325)	-.501	(.309)	.555	(3.014)	-.858	(.676)
Hispanic			.419	(.271)	.480	(3.609)	.766	(.500)
Intercept	-3.133**	(1.041)	-2.820**	(.890)	35.449*	(15.369)	.334	(1.170)
Random Effect								
Intercept	.022	(.042)	--	--	32.120	(19.307)	.362	(.169)
N	864		1255		771		670	
AIC	1157.518		1541.704		6853.860		852.967	

Note: All models except CCAP are multilevel logistic regressions; CCAP is a multilevel linear regression.

Table 5.5 Districting Principles and Non-Trust Evaluations, Multilevel Logistic Regressions

	Favorable Opinion of Gov.		Approval of Leg.		Responsiveness: Leg.		Responsiveness: Rep.	
	b	(s.e.)	b	(s.e.)	b	(s.e.)	b	(s.e.)
Aggregate								
Coterminous	-.455	(.329)	-.106	(.074)	.559	(.424)	.791+	(.426)
Compact	.255	(.540)	.093	(.123)	-.143	(.684)	-.232	(.695)
Pct. Urban	.180	(.201)	-.030	(.045)	-.111	(.246)	-.248	(.244)
Constituency Size	-.003*	(.001)	-.002**	(.001)	-.007**	(.002)	-.004*	(.002)
Gov. Approval			2.150**	(.300)				
MMD Upper	.017	(.011)	-.001	(.002)	-.011*	(.005)	-.004	(.005)
MMD Lower	.005	(.004)	-.000	(.001)	-.003	(.004)	-.002	(.004)
Term Limits	-.008	(.225)	.130	(.089)	-.125	(.242)	-.009	(.226)
Divided Gov.	.773**	(.215)	.594**	(.077)	.317	(.241)	.307	(.229)
Pct. Black	.001	(.012)	-.890*	(.409)	-.431	(1.173)	-1.740	(1.079)
Median Income	-.020	(.006)	-.004	(.006)	-.017	(.015)	-.016	(.014)
Individual								
Republican	.230	(.162)	-.058	(.053)	.474	(.306)	-.144	(.315)
Democrat	.285+	(.158)	.196**	(.052)	.386	(.319)	.168	(.328)
Electoral Winner	.829**	(.194)	1.661**	(.043)	.996**	(.261)	.608*	(.261)
Male	-.128	(.128)	-.375**	(.029)	.136	(.180)	-.082	(.181)
Age	.000	(.004)	-.006**	(.001)	-.009	(.006)	-.004	(.006)
Education	-.095*	(.044)	-.040**	(.015)	-.036	(.064)	.085	(.064)
Income	.014	(.034)	-.012*	(.005)	.027	(.046)	.004	(.047)
Black	-.256	(.247)	.252**	(.052)	.423	(.539)	.427	(.562)
Hispanic	-.037	(.254)	.176**	(.056)	1.598*	(.653)	.423	(.522)
Intercept	1.414	(.898)	-1.061**	(.398)	1.511	(.991)	1.340	(.962)
Random Effect								
Intercept	.145	(.071)	.046	(.013)	.096	(.102)	.026	(.084)
N	1211		23068		659		650	
AIC	1541.861		28535.531		832.050		805.432	

Note: All models are random intercept multilevel logistic regressions. + p < .1, * p < .05, ** p < .01, two-tailed test.

Table 5.6. Districting Principles and Communication, Random Intercept Multilevel Logistic Regressions

	Contact		Met in Person	
	b	(s.e.)	b	(s.e.)
Aggregate				
Coterminous	.369	(.406)	.843*	(.399)
Compact	.782	(.644)	-.511	(.638)
Pct. Urban	-.072	(.232)	-.123	(.226)
Constituency Size	.001	(.002)	-.007**	(.002)
MMD Upper	.003	(.005)	-.004	(.005)
MMD Lower	.001	(.004)	.004	(.004)
Term Limits	-.226	(.232)	.045	(.228)
Divided Gov.	-.113	(.236)	.324	(.237)
Pct. Black	.700	(1.115)	.126	(1.113)
Median Income	.021	(.015)	.018	(.014)
Individual				
Republican	-.036	(.299)	-.067	(.298)
Democrat	-.393	(.312)	-.134	(.310)
Electoral Winner	.026	(.237)	-.001	(.239)
Male	-.193	(.168)	.035	(.168)
Age	.015**	(.006)	.009	(.006)
Education	.197**	(.060)	.074	(.060)
Income	.110*	(.044)	.133**	(.044)
Black	.039	(.515)	.877+	(.495)
Hispanic	-.109	(.461)	.135	(.491)
Intercept	-3.709**	(.982)	-2.724**	(.957)
Random Effect				
Intercept	.099	(.090)	.090	(.086)
N	673		672	
AIC	923.551		916.343	

Note: Both models are random intercept multilevel linear regressions. Data source is the October 2009 University of Iowa Hawkeye Poll. Missing responses for the income variable were imputed using other demographic data to avoid losing cases. + $p < .1$, * $p < .05$, ** $p < .01$, two-tailed test.

Figure 5.1. Shape Differences: Comparing North Dakota's 1st Senate District and California's 22nd Senate District.

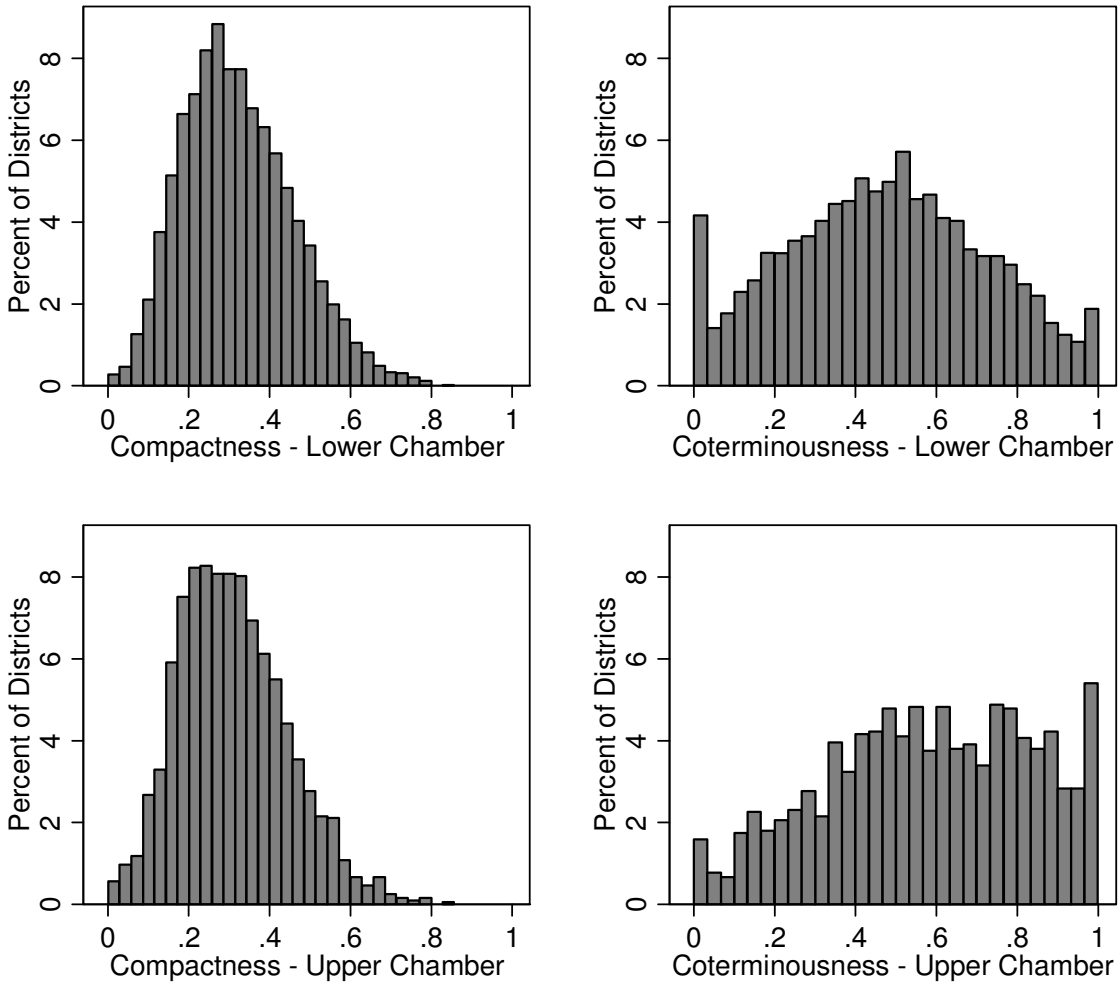

Figure 5.2 Histograms of Geographical Districting Principles, Lower and Upper Chambers, Post-2000 Redistricting

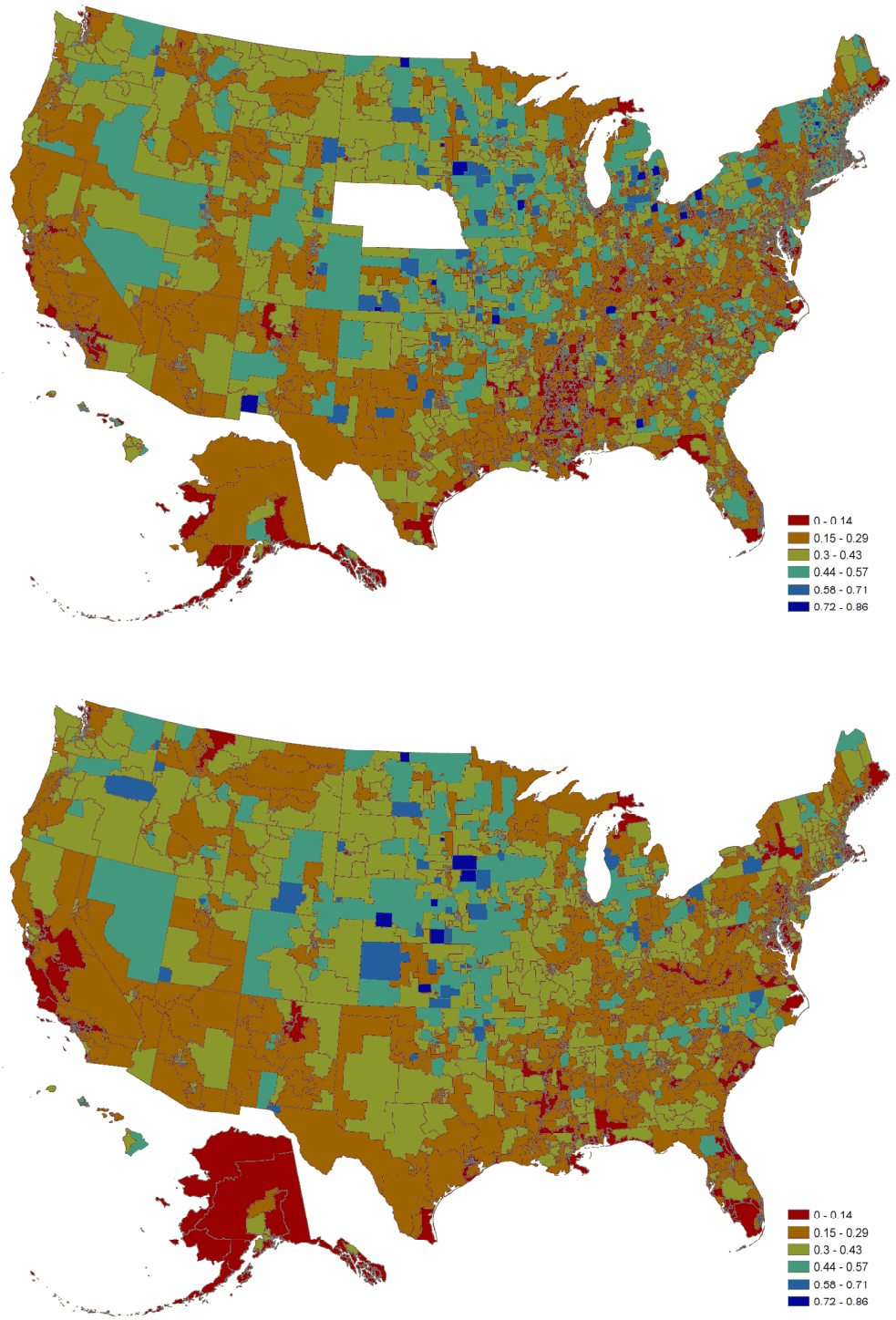

Figure 5.3. Geographical Distribution of Lower Chamber (Top) and Upper Chamber (Bottom) Compactness Scores

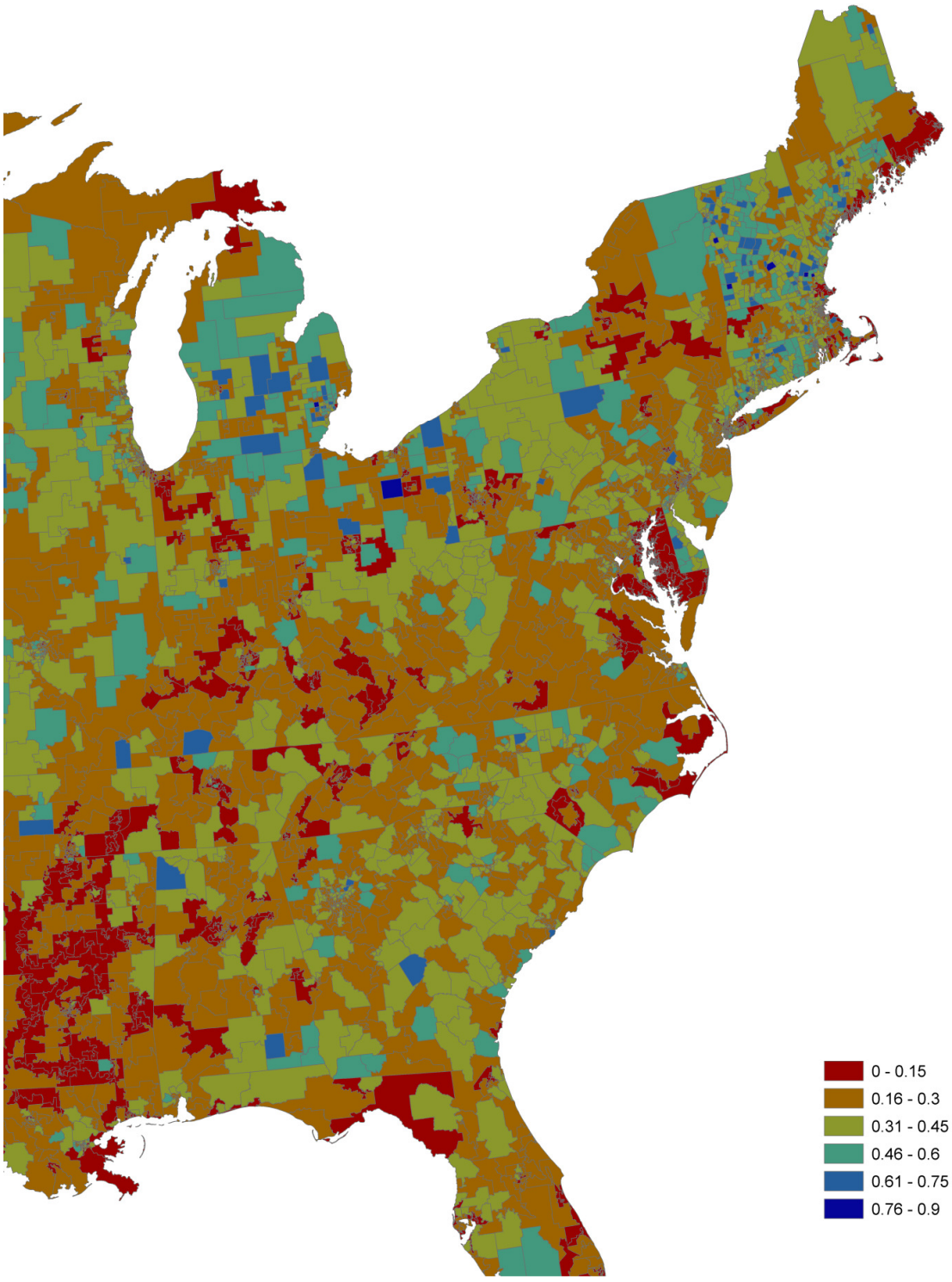

Figure 5.4. Geographical Distribution of Lower Chamber Compactness Scores, Eastern U.S.

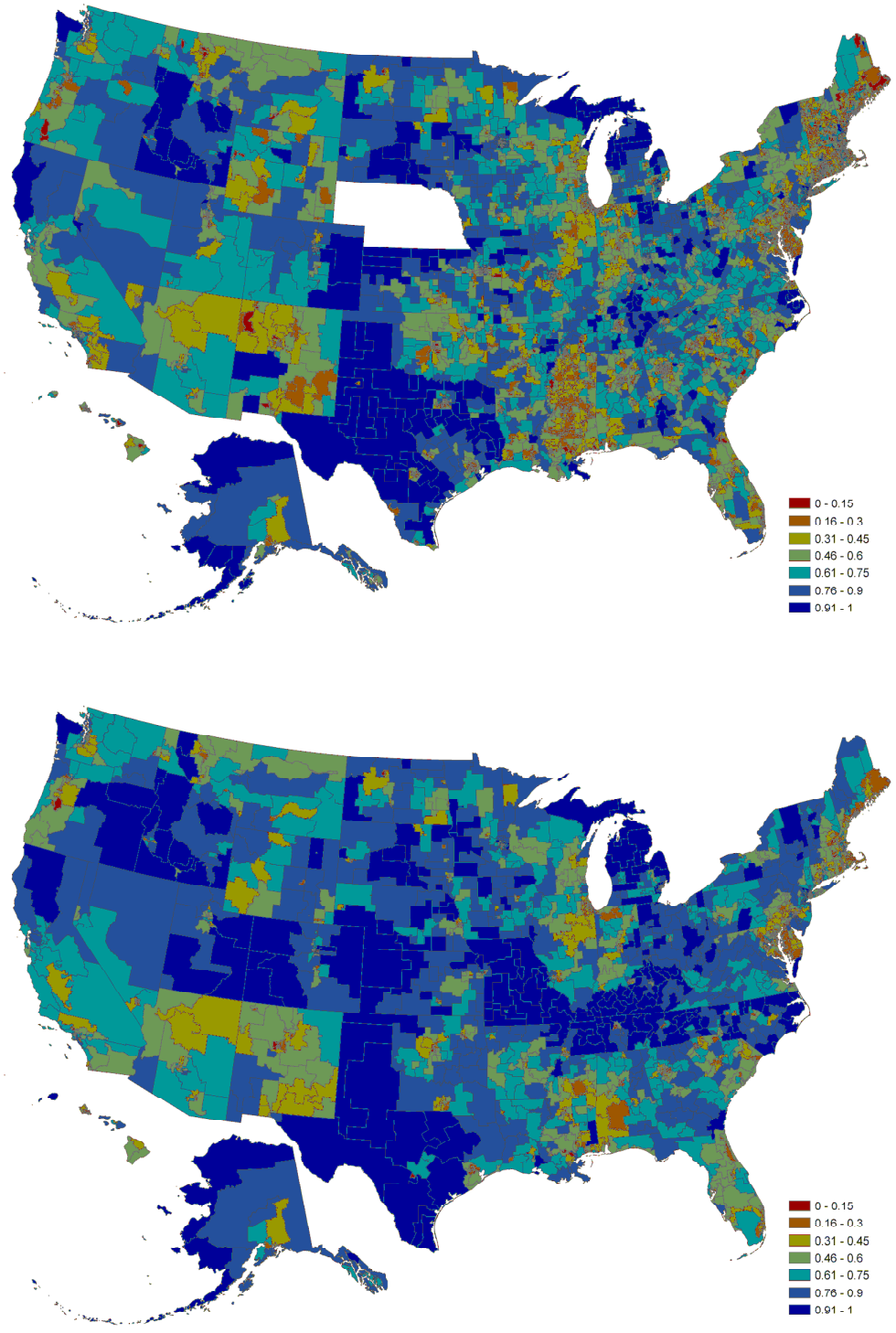

Figure 5.5 Geographical Distribution of Lower Chamber (Top) and Upper Chamber (Bottom) Coterminousness Scores

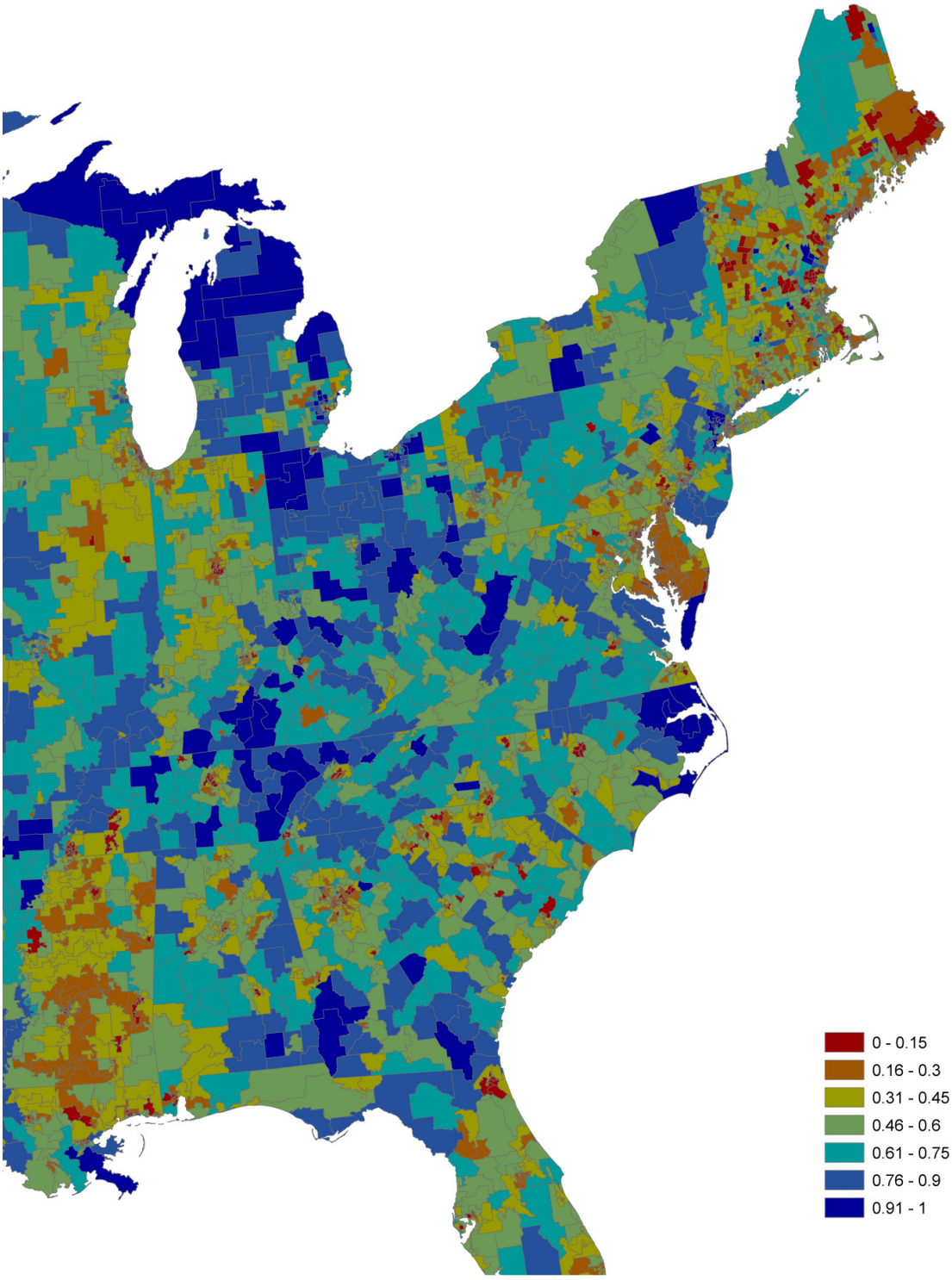

Figure 5.6. Geographical Distribution of Lower Chamber Coterminousness Scores, Eastern U.S.

CHAPTER 6. DISTRICTS AND REPRESENTATION IN THE PEOPLE'S HOUSE

The House of Representatives is undoubtedly the most studied legislative assembly in history. Studies have examined legislators' voting patterns, committee membership and structure, House leadership, historical institutionalization and development, polarization, party control, campaign strategies, and candidate recruitment, as well as many other topics related to the people's house and its members. A large literature has addressed the linkage between representatives and constituents both from the representative's perspective and from the constituents' perspective, but few studies have seriously considered the possibility that congressional districts play a role in creating, maintaining, or altering that representational linkage. This chapter aims to fill in this gap by examining the potential link between congressional districts and the representational relationship through the simultaneous analysis of multiple district characteristics.

6.1 Districting Studies and the Two-Headed American Gerrymander

In the eyes of many observers, the gerrymander is almost synonymous with legislative redistricting. It is the most prominent aspect the redistricting process as discussed in introductory high school and undergraduate textbooks. Perhaps it is not a surprise, then, that the empirical literature on legislative districts has focused almost exclusively on the gerrymander, its causes and consequences. Two types of gerrymanders have received the most attention: the partisan and racial gerrymanders.

The partisan gerrymander is well known to students of American politics. From its famous beginnings in a Massachusetts 1812 political cartoon, the partisan gerrymander has always captivated attention. Since partisans in state government (particularly the state legislature) draw both state legislative districts and congressional district boundaries in most states, The idea that politicians will manipulate the redistricting process to generate advantages that benefit of their political party has appeared at odds with a representational system built on geographic districts and fair elections. Recent scholarship has highlighted the role of the redistricting process in gerrymandering: institutional control certainly influences *who* the process benefits, either the majority party or incumbent protection(McDonald 2004; Schaffner, Wagner, and Winburn 2004).

An equally detailed literature has examined the creation of House districts designed to maximize the descriptive representation of underrepresented racial groups like African Americans and Latinos. The main thrust of this literature has been on the connection between the creation of majority-minority districts and substantive policy representation. Scholars have looked at whether the majority-minority districts aid the Republican Party by "packing" minority voters, who tend to be predominantly Democratic, into a few districts, removing these voters from the surrounding districts (Cameron, Epstein, and O'Halloran 1996; Lublin 1999). Since 1992, the Supreme Court has entered the fray of race-based redistricting with the advocacy of traditional districting principles as race-neutral districting measures that could be used to avoid the appearance of a racial gerrymander when drawing majority-minority districts.

One of the interesting aspects of studying redistricting through the twin lenses of the partisan and racial gerrymanders is how such a perspective focuses attention on certain types of political outputs. This perspective encourages a view of districts as *indirect* influences on representation: redistricting matters for representation only in how it influences partisan bias in the political system or the representation of racial groups. To put it differently, districts influence representation through the gerrymander in either of its forms. In the absence of attempts to maximize political power of party or racial groups or incumbent politicians through the design of district boundaries, districts do not influence representation. This view is unnecessarily narrow. If districts structure interaction between constituents and representatives, the possibility that district characteristics - in and of themselves rather than working through partisan or racial paths - alter the aspects of the representational relationship needs to be examined.

6.2 District Characteristics and Congress

The lion's share of the empirical literature on district characteristics has looked at Congress and the House of Representatives more specifically. Research has found a strong relationship between constituency size and contact between constituents and legislators in both the U.S. House (Frederick 2007, 2009) and U.S Senate (J. R. Hibbing and Alford 1990; Lee and Oppenheimer 1999). Similar relationships have been found between constituency size expectations of political behavior: constituents expect Senators to do work harder to obtain federal funds for small states than large states (Hibbing and Alford 1990; Lee and Oppenheimer 1999). and evidence suggests they do just that (Lee 1998).

Brian Fredrick (2007, 2009) has conducted the most thorough studies to date on the influence of constituency size on representation in the House. Utilizing a unique research design that takes advantage of the available data, Fredrick analyses the role of constituency size during census years, when data is the most accurate, and ten years of population change and residential mobility have altered the population sizes of districts. This design maximizes the intra-state variance on congressional district constituency size; by the end of the decade, by the end of the decade population growth and residential mobility have dramatically altered congressional district constituency sizes. Fredrick finds constituents from smaller House districts are more likely to be contacted by their representative, more likely initiate contact with their representative, more likely to believe their representative is helpful and more willing to take problems to the representative. Further, he shows evidence that larger constituency sizes in the House are associated with more extreme representative voting patterns and greater divergence between constituent ideology and DW-NOMINATE scores. Fredrick suggests this is due to the creation of heterogeneous districts. In the face of political heterogeneity, House members cater to their party base causing the extremism and divergence. Thus Fredrick's work corresponds closely with the arguments made here regarding constituency size.

Research on geographic districting principles is less extensive. While Engstrom (2000) finds a positive relationship between geographic compactness and voter turnout, this effect does not show up in one of Engstrom's later studies (2005). Altman (1998a) shows evidence of a small relationship between turnout and compactness, but no relationship between turnout and evaluations of House members using National Election Studies data. Recently, Winburn and Wagner (forthcoming) uncover a relationship

between county-congressional district congruence and the ability of survey respondents to recall their House member's name. Engstrom (2005) shows a similar positive relationship between media market- congressional district congruence and candidate recall, but finds no effects for county-congressional district congruence.

Little evidence, then, has been marshaled to study the role of district characteristics on representation in the U.S. House. What evidence does exist shows fairly strong support for constituency size effects and in the direction expected by Frederick and predicted here: larger constituency sizes lead to negative evaluations of representatives and institutions and reduced communication and information transmission between constituents and legislators. The evidence regarding districting principles is decidedly mixed with little support for the hypothesis that compactness enhances the representational relationship and some modest evidence that districting practices which protect political subdivisions like counties may strengthen constituent-legislator communication and information transmission.

This literature, however, is lacking in several areas. First, the scarcity of studies on district characteristics and representation in the House suggest more research is needed to verify previous studies using non-ANES data sources. Second, no study on representation in the House has simultaneously addressed the scale, shape, and depth of district boundaries. In other words, additional research is needed to incorporate more district characteristics into the same analysis since district characteristics do not operate in isolation of one another; district characteristics can be significantly correlated with each other, complicating the interpretation of models omitting variables. Further, only Engstrom (2005) even tests for two characteristics in the same model. Third, the public

opinion datasets utilized in previous studies have relatively small sample sizes within congressional districts. The work presented here is mostly based on the 2008 Cooperative Congressional Election Study, a 30,000+ respondent national survey of American registered voters conducted over the internet, which has on average 75 respondents per congressional district. Fourth, no previous study has utilized multilevel modeling to garner the most accurate parameter estimates from data generated at multiple levels. And fifth, no study has utilized both the compactness and coterminousness measures put forward here (see Chapter 3 for a discussion of the measures). Since some measures of districting principles are substantially different from others, results of empirical studies of such characteristics may be dependent on the measure used (Altman 1998c; Niemi, Grofman, Carlucci, and Hofeller 1990). For all these reasons, then, there is ample need for additional study on these issues in the House setting.

District characteristics and representation in Congress has normative implications for the study of democracy. At America's founding, representation of the population was entrusted to the House of Representatives. The House was designed specifically to be close to the people, to reflect the passions and character of the people, and to represent their interests before the federal government. In stark contrast, the Senate was deliberately removed from the populous: six year terms, large (state-wide) constituencies, and indirect election through state legislatures were meant to remove the Senate, to make that body a deliberative, consensus-building chamber. While both are legislative chambers with distinct geographical constituencies, the House and the Senate were designed with a different purpose in mind. The point bears repeating: the House is the representative cog in the federal government machine. Neither the Senate nor the

presidency is charged with the task of retaining a close linkage with the American people. If the House is not the representative chamber, no other entity in the federal government is designed to pick up the slack.

Despite the importance of maintaining a close relationship with constituents and giving voice to the wide spectrum of opinion on matters of public concern in the institutional mission and design of the House of Representatives, remarkably little attention was given to the issue of legislative districts and district size in the U.S. Constitution. These matters were left to be addressed through political means, probably due to the contentiousness of the representational issues inherent in apportionment and districting. The Constitution mandates a decennial census to be used to apportion the seats to the states, but does not delineate the method by which the seats should be apportioned (except that each state should receive at least one seat) or the number of seats to be apportioned. Once the states receive their official number of allotted seats, creating and defining district boundaries is left to state legislatures to address through the political process. Because of freedom granted to the states by the Constitution in matters of districting, substantial variance exists on the three characteristics of study here.

6.2.1 Congressional District Constituency Size

Far from the 30,000:1 residents to representatives minimum ratio mandated in the Constitution, in 2002 each member of the House represented, on average, approximately 650,000 residents. The average, however, hides important variation in House constituency sizes both across states (inter-state) and within states (intra-state). The peculiar method of apportionment of House seats leads to some surprisingly large differences between states, since each state, regardless of population size, is guaranteed a

seat. With the 435 seat ceiling placed on the size of the House, and quickly growing large population states like Florida, California, and Texas, small states regularly lose representation, even during times of moderate population growth. For states with a small number of seats, any changes in the number of seats apportioned has a large influence on the average constituency size for the districts within that state. It is no wonder that Montana sued the U.S. government after losing a congressional district in the apportionment following Census 1990 - that loss cut Montana's House delegation in half and doubled the size of its average constituency size - all without much change to Montana's state population.[1]

Large states with many congressional districts can easily deal with gaining or losing a seat; the population change is distributed throughout the other districts. The inter-state variance in House constituency sizes, then, occurs among small states, while large states have average constituency sizes close to the national average. Figure 6.1 shows the scatterplot between state population size and average House district constituency size after the 2000 Census. The distinct variance pattern is clear in the figure: populous states with many congressional seats have average constituency size very close to the national ideal constituency size just under 650,000 residents per district. Most of the inter-state variance in congressional districts occurs in small states.[2]

Since *Karcher v. Daggett* (1983), the Supreme Court has set exact intra-state population equality between congressional districts as the legal standard. Thus, newly

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[1] *United States Department of Commerce v. Montana*, 503 U.S. 442 (1992).

[2] See Ladewig and Jasinski (2008) for a similar figure displaying the relationship between average House district constituency size by state and state population for all states from 1920 through 2000.

reapportioned seats after the decennial census necessarily limit variation on congressional district constituency sizes to inter-state variation. But the 435-seat ceiling imposed on the size of the House ensures this variation is non-trivial in nature (Ladewig and Jasinski 2008). The lack of intra-state variation, however, is rarely a political reality. By the time congressional elections are held for the newly reapportioned seats, the census data is nearly two years out of date. America is a nation of movers; high residential mobility and population fluctuations can lead to substantial constituency size difference between congressional districts of the same state. Frederick (2007, 2009), in order to leverage both the intra-state and inter-state variation of constituency size, analyzes public opinion and congressional roll call data in census years, before seats have been reapportioned and boundaries redrawn. The Census Bureau has tabulated population data by congressional district for the past few censuses, providing a look at the constituency size of House districts at the height of their variability and when accurate population data exists.

Since the 2010 Census has not been conducted at the time of this writing, Fredrick's strategy cannot be utilized in this project if recent survey data is to be used. Further, the CCES, with its large sample sizes within congressional districts, was conducted in the 2008. In order to utilize this data, a process similar to Frederick's was followed. In 1996, the Census Bureau began testing for the American Community Survey (ACS), a continuous, large-sample survey which would provide demographic estimates for political units between official censuses. This program was expanded in the 2000s, and nation-wide data collection began in 2005. The ACS provides 1, 3, and 5 year average estimates of various political units over 20,000 persons based on a survey size of 3 million households a year. Congressional district 3-year estimates are currently

available for the 2005-2007 and 2006-2008 period.[3] The latter estimates are used to provide population data for congressional districts in 2008. These data are combined with initial consistency size data based on the 2000 Census to get both an estimate of current congressional district constituency sizes and change in constituency size from 2000 to 2008. Histograms of the frequencies of 2008 congressional district constituency size and the initial congressional district constituency size based on Census 2000 data are displayed in Figure 6.2.

After the 2000 reapportionment, Montana was the largest congressional district with 902,000 constituents. Wyoming was the smallest, with only 494,000 residents. Five short years after the first election with these district boundaries, both the smallest and largest districts had changed. Louisiana's hurricane-stricken 2nd District, centered on New Orleans, lost a third of its residents and is the smallest congressional district in the country with 432,000 constituents. Arizona's 6th District, covering the western Phoenix suburbs of Mesa, Gilbert, and Apache Junction, saw almost 50 percent growth during the decade and currently boasts 963,000 residents.

As is clear from the Figure 6.2, substantial population growth has occurred (the mean constituency size has increased by almost 50,000 persons per district). This growth has been uneven, with some districts seeing large shifts while other evincing little change. The key information presented in Figure 5.2 is the increasing standard deviation of constituency size during the decade. By 2008, the standard deviation had more than

[3] For more information see: http://www.census.gov/acs/www/AdvMeth/.

doubled its original 2000 values.[4] By 2008, substantial population shifts across congressional districts have created meaningful intra-state, as well as inter-state, variation on constituency size.

6.2.2 Congressional District Boundary Characteristics

Maps displaying the coterminousness and compactness measure for the 110th Congress (2007 - 2009) are presented in Figures 6.3 and 6.4. The tendency of states to draw compact or coterminous districts varies both by state and within states. Rural states, and rural areas of states, are more likely to have boundaries coterminous with subdivision boundaries, which is not surprising given the historical reliance on counties as district building blocks. Highly-populated areas make it more difficult to rely on county boundaries. Further, all at-large congressional district states by definition have boundaries completely coterminous with state boundaries. Coterminous boundaries are also relatively common. While only a small number of districts are entirely coterminous with subdivision boundaries, 47% of 110th congressional districts boundaries are at least 75% coterminous with political subdivision boundaries.

Compactness, however, does not have as strong of a relationship with urbanism.[5] Some very small districts, like New York's 16th which covers part of The Bronx in New York City, are relatively compact. Yet the nation's most compact district is the state of Wyoming (compactness = .77, while the nation's fourth least compact district is Alaska

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[4] I have referred to 2000 population figures, rather than 2002 numbers, since starting estimates for the newly drawn congressional districts prior to the 2002 mid-term election provided by the Census are used population data from the Census 2000 and hence describe the new districts as if they had existed in 2000.

[5] Coterminous is correlated with congressional district urbanism at $r=-.54$ ($p<.001$), while compactness is correlated at $r=-.18$ ($p<.001$).

(compactness = .025). Compactness is somewhat more rare than coterminousness: the mean district compactness score is .22 and over 75% of congressional districts have a compactness score of less than .3.[6]

What is apparent from Figure 6.3, is compactness' relationship to coastal areas. Alaska, Maryland, Texas, North Carolina, and Massachusetts all have coastal areas that are naturally non-compact, either due to peninsulas or islands. Such states simply cannot draw compact districts in those areas. For this reason several authors (Altman 1998a; Niemi, Grofman, Carlucci, and Hofeller 1990) caution against comparing compactness scores across states, particularly when considering instituting a minimal compactness standard for congressional districts, given the constraints placed on some states due to state geography. In the multivariate analysis that follows, the compactness of a state's border is included as a control variable to account this unequal effect of geography.

Compactness and coterminous are also related to each other. The correlation between the two district characteristics is r=.39 ($p<.001$). While it is certainly possible for the districting principles to work against each other (Cain 1984), as many city boundaries are non-compact, the principles typically are mutually reinforcing. A comparison of the mean district coterminousness score across the quartiles of compactness shows a monotonically-increasing coterminousness score, from .59 in the lowest quartile of compactness to .82 in the highest. This relationship is important for redistricting reform efforts. While the two principles may be odds in any given district, it is certainly possible

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[6] Of course, not too much should be read into the exact compactness score, as it is dependent on the use of a circle as the ideal shape. Square or hexagons, which could actually be used to cover geographic space, would increase the *absolute* compactness score for districts (but make no *relative* difference, since changing the ideal shape used in the compactness formula simply modifies each score by a constant).

for mapmakers to advance both compactness and coterminousness in districting plans. Reasonable scores on both measures are attainable for most states. Further, and more importantly, since the principles are empirically related to one another, it is important to account for both district characteristics in empirical models. It is not sufficient to examine one district characteristic in isolation, and as will be shown in the next section, both characteristics have significant effects on the representational relationship.

6.3 The 2008 Cooperative Congressional Election Study

The 2008 CCES is ideally suited for studying the representational relationship from the perspective of constituents. The survey is large - over 32,000 respondents in all 50 states and all 435 congressional districts. At least twenty respondents from each congressional district are included in the survey, with an average of 75 respondents per district. Such large samples are made possible by the survey's unique sample methodology: the CCES is an internet survey which randomly selects names from large population lists and then matches those randomly selected names with respondents who have opted into similar surveys. The matching is based on demographic, geographic, and attitudinal data.[7]

The 2008 CCES contains several questions which address the representational relationship. Two questions measure evaluations, three address communication and information transmission, and three tap perceptions of responsiveness. These questions provide an excellent opportunity to test for the effect of district characteristics on a many

[7] Sample matching was used to construct the sample (Vavreck and Rivers 2008). The sample was stratified by state to ensure large sample sizes of both large and small states. More information regarding sample matching is available at http://web.mit.edu/polisci/portl/cces/material/sample_matching.pdf.

indicators of the strength of the representational relationship. The evaluations are simple approval questions. Each respondent was asked "Do approve of the way [individual or institution] is doing their job?" Respondents were given the option of selecting strongly approve, somewhat approve, somewhat disapprove, or strongly disapprove. These approval ratings were given for both representatives in the House and Congress as an institution.

Respondents were also asked about contact with their representative.: asked "Have you (or anyone in your family living here) contacted Representative [name] or anyone in [name's] office?" The question taps constituent-initiated contact. Respondents were also asked if they could recall the party of their representative and if they knew the race of their representative. This battery of questions should provide a good test for communication and information transmission. If districts make constituent-legislator communication more effective, then such an influence should be evidenced in the party and race recall questions. If district characteristics can make it easier for citizen to place themselves within the geographic system of districts, the percentage of respondents saying they have contacted their representative should increase accordingly.[8]

The final battery of questions addresses common components of representation: service, policy, and allocation responsiveness. Eulau and Karps (1977) identify four components of responsiveness: the three mentioned above and symbolic responsiveness. The CCES does not contain a suitable question on symbolic responsiveness, or the

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[8] Question wording on the party recall question was: "Please indicate whether you've heard of this person and if so which party he or she is affiliated with: [Representative's name]". The race recall questions was worded as "What is the race or ethnicity of your member of the U. S. House of Representatives?"

symbolic gestures representatives undertake to garner legitimacy, trust and support from constituents, but questions in the survey do fit the other three categories. Service allocation, to Eulau and Karps, refers to the ability of representatives to provide selective benefits to constituents. In other words, service responsiveness is the ability to respond appropriately to constituent requests for help and services. Each respondent who reported contacting their House member was asked if they were satisfied with the outcome of the contact.[9]

Policy responsiveness is the congruence between citizen and representative public policy decisions. Do representatives ideologically represent constituent opinion on the most important political issues? To address policy responsiveness, the absolute value of the ideological self-placement of the respondent was subtracted from the respondent's perception of the ideological placement of his or her representative (measured on a 100 point liberal-conservative scale). Thus the greater the distance between a respondent's ideological self-placement and the placement of his or her representative, the less responsive the representative is to his or her constituent's policy opinions. Finally, allocation responsiveness, or the ability of the representative to secure federal funding for district projects, is tapped through a question of whether the respondent recalls any projects the representative brought to the district.[10] This final item contains a

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[9] Exact question wording was "How satisfied were you with the response to that contact?" with the response choices of very satisfied, somewhat satisfied, not very satisfied, and not at all satisfied.

[10] Question wording was: "Can you recall any specific projects that your members of Congress brought back to your area?" with response options of yes and no.

communication component as well; part of each representative's job is to make known their efforts on behalf of the district to their constituents.

In the next section, the bivariate relationships between the key district characteristic variables of constituency size, compactness, and coterminousness and the evaluation, communication and responsiveness questions in the CCES are presented. The following section extends these bivariate relationships by developing a multivariate multilevel model to test for the effects of district characteristics on citizen evaluations and behaviors while accounting for both individual and congressional district factors.

6.4 Empirics

6.4.1 Bivariate Relationships

The first tests of the theory at the congressional level are presented in Tables 6.1 and 6.2. The tables show mean comparison tests by quartile of the independent variable of interest. The cells of each table present the average score on the dependent variables for each quartile of the independent variables. Constituency size and change in constituency size from 2000 to 2008 are shown in Table 6.1, while compactness and coterminousness results are found in Table 6.2.

Table 6.1 shows a relationship between constituency size, whether it is measured as current size or change in constituency size, and the strength of the representational relationship. Moving from the first to fourth quartiles of constituency size results in a 4 to 5 percentage point drop in approval of their member of Congress and a three to four point drop in Congressional approval. The first to fourth quartile change in constituency size or growth of constituency size is associated with a corresponding four point drop in the percentage of respondents able to correctly recall their representative's party and a four to

six point decrease in the ability to correctly identify the race of their House member. Finally, the same change in constituency size is also associated with a four and a half point decrease in the percentage of respondents who recalled a project the representative brought back to the district. Changes in contact, satisfaction with constituent service, and ideological divergence are relatively small. All relationships are in the expected directions, with constituency size negatively related with approval, communication, service and allocation responsiveness. Thus, without individual and aggregate controls, there is a clear negative trend: respondents from congressional districts with larger constituency sizes report lower ratings of their House member, lower ratings of Congress, less likely to recall basic information about their representative, and less likely to recall a project their representative brought back to the district.

Similar results are shown in Table 6.2 regarding compactness and coterminousness. By and large, the findings support the theory: both district characteristics are positively related with communication and responsiveness measures. Contrary to expectations, the mean comparisons tests show little relationship between the boundary characteristics and representative approval. Further, both compactness and coterminousness are negatively associated with Congressional approval. But the communication and responsiveness relationships are largely in accordance with expectations. Residents from highly compact districts have a five percentage point higher rate of contacting their representative, a four point increase of recalling their representative's party, and a large eight point higher rate of recalling the race of their representative compared to residents from the least compact districts. Residents from

compact districts are slightly more likely to say they can recall a project their representative brought to the district over respondents from non-compact districts.

Coterminousness is most strongly related to contact, race recall, and allocation responsiveness, with the mean comparison test for each of those three items showing at least a seven point increases over non-coterminous districts. This evidence supports the findings of Chapter 4, where geographic districting principles were shown to be more strongly related to interaction with state legislators than to attitudes about state government or the state legislature.

Again, this evidence shows support for the theory: compactness and coterminousness are generally associated with more constituent-legislator communication, better information retention, and greater responsiveness. That being said, it is important to note that none of the district characteristics influences the perceived ideological distance between respondents and their representatives, and the boundary characteristics show weak relationships with the approval measures.

6.4.2 Multivariate Analysis

Districting is a complex process. Redistricting reform efforts frequently are frustrated because in order to advance one redistricting goal (say protecting underrepresented minority groups) other goals must be sacrificed (like electoral competition). Districts, as intermediary legislative institutions, should theoretically influence citizen opinions and behavior, legislator opinions and behavior and the linkage between the two - in other words, districts should influence many different aspects of representative government. In order to correctly isolate the roles of constituency size, compactness and coterminousness, an array of variables both at the individual and

congressional district levels must be accounted for. The models presented here are very similar to those in Chapters 3 and 4 yet have some important differences worth noting.

Individual level: In addition to the basic demographic and SES variables which form the core of most public opinion and political behavior models like those presented in Chapters 3 and 4, a number of important political variables have been included. First, a variable measuring whether the respondent was represented in the House by a member of his or her political party is included. A growing literature has found status as an electoral winner to be influence attitudes and behaviors, and has long been thought to be associated with support for the national political system (A. H. Miller 1974; Anderson and Guillory 1997; Anderson and LoTempio 2002; Bowler and Donovan 2007). Further, it is probable that respondents are more likely to contact members of their own party in government, if for no other reason then that such fellow partisans should be more receptive of policy requests.

Secondly, the race of House members is incorporated into the analysis through the inclusion of a descriptive representation indicator variable. Respondents whose representative is of the same race were coded 1 with all other respondents coded 0. Previous research on race and political trust and constituent-legislator linkage shows greater trust and more constituent-legislator communication when respondents are represented by someone of their own race (Gay 2002; Bobo and Gilliam 1990).

Third, residential mobility is also included in the models, since mobility decreases voting participation (Squire, Wolfinger, and Glass 1987). Redistricting literature has clearly established the weakened connection between representative and constituents when district boundaries change, incorporating new residents who have no knowledge or

experience with the representative. Thus redistricting damages the incumbency advantage in congressional elections by severing established connections between voters and representatives (Ansolabehere, Brady, and Fiorina 1992; Desposato and Petrocik 2003; Crespin 2005; Hayes and McKee 2009; McKee 2008c, 2008a). Likewise, residents who move from one district to another are in a similar position. They have not been exposed to the efforts of the House member to create a representational relationship with district, decreasing the likelihood the resident approves of his or her representative, knows information about the representative, or has contacted the representative.

A different battery of aggregate level covariates is included in the model than the ones found in the state level analyses in earlier chapters. The key independent variables of constituency size, compactness, and coterminousness are essential components of the model for reasons already explained. The compactness of state boundaries is included to account for geographical limitations coastal states face in drawing compact districts. In the multivariate analysis presented here, the growth in constituency size is presented in the models rather than the raw constituency size values. In many cases, the change variable slightly outperformed the raw numbers. This makes intuitive sense: skilled politicians may be able to lessen the detrimental effects of a high constituency size by increasing their outreach efforts and devoting more time and resources to constituent service. A quickly changing constituency population, however, may not provide enough time for the House member to react: modeling constituency size as change in constituency size focuses attention on the changing social environment is influencing representation.

The other aggregate variables are measured at the congressional district level. Two political variables are important components of the model: competitiveness of the House race in the respondent's district, and the length of time the representative has been serving in the House. Competitiveness is a necessary control. Voters learn information about candidates through campaigns; mobilization is one aspect of the representational relationship that may spill over into constituent-legislator linkage after the election. Electoral competition has long been associated with greater interest in elections, greater incentives to vote, higher participation rates, and more elite mobilization (Downs 1957; Riker and Ordeshook 1968; G. W. Cox and Munger 1989; Leighley and Nagler 1992). Competition is also thought to be a crucial link in the representational relationship, ensuring a connection between public opinion and responsiveness in the political system (Mayhew 1974; Ansolabehere, D. Brady, and Fiorina 1992; Swain, Borrelli, and Reed 1998). Further, competition is related to districting principles, as research on partisan and racial gerrymandering makes clear (McDonald 2006; Swain, Borrelli, and Reed 1998); but these connections are questioned or augmented by other research (Abramowitz, Alexander, and Gunning 2006; Gelman and G. King 1994; Brunell 2008). Competitive elections may also lead to media spending and advertisements which, rather than clearly communicating information to voters, may create uncertainty about candidates' preferences and activities (e.g. Downs 1957).

The longer the House member has served in Congress, the more time he or she has had to cultivate a relationship with voters. Further, with seniority (generally) comes influence and position within the House (Goodwin 1959; Wolfinger and Heifetz 1965; N. W. Polsby, Gallaher, and Rundquist 1969) which may increase the probability citizens

will try to contact them and the ability of MCs to secure funds for the district. Further, given the connection between redistricting and incumbent protection (Murphy and Yoshinaka 2009; McDonald 2004; Schaffner, Wagner, Michael W., and Winburn, Jonathan 2004), district characteristics may influence length of time served in Congress; therefore it is important to accurate estimates of the role of districting characteristics in the representational relationship to account for seniority or tenure effects.

Aggregate demographic variables of urbanism (measured as the percentage of the district categorized as urban by the Census Bureau) and a racial diversity index (Sullivan 1973). Urbanism has been associated with lower political participation, due to higher campaign costs and greater residential mobility (Squire, Wolfinger, and Glass 1987; G. W. Cox and Munger 1989). Heterogeneity may decrease the connection between constituency characteristics and legislative behavior (Bailey and D. W. Brady 1998; Gerber and Lewis 2004), make it more difficult for challengers to locate successful issue positions (Ensley, Tofias, and Marchi 2009) and may decrease mobilization and turnout (Hill and Leighley 1999). Lastly, a variable measuring the median income of the congressional district is also included, since poor areas face different representational demands and issues than do wealthy ones.

As in the previous chapters, multilevel models were conducted to match the two units of analysis in the data (individual respondents and congressional districts). Since individuals are exposed to various aggregate influences which are paramount to this study, it is crucial that the modeling strategy employed treats the data is coming from multilevel sources. The Table 6.3 presents the approval of representative and approval of Congress models. The communication and information transmission models (respondent-

initiated contact, recall of House members' party and race) are shown in the second table (Table 6.4), and Table 6.5) displays the results from the three responsiveness models (satisfaction with House member contact, perceived policy divergence, and recall of project House member brought to district). The approval models utilize multilevel linear regressions with the 4 point ordinal scales.[11] The policy divergence model is also a multilevel linear regression. All other models are multilevel logistic regressions.[12]

6.5 Results

6.5.1 Congressional Approval

Presented in Table 6.3, the multilevel logistic regressions show only marginal support for the theory. Change in constituency size from 2000 to 2008 is negatively and significantly ($p<.1$) related to approval of one's member of congress. Thus individuals residing in districts greater constituency size growth have lower approval ratings of the representative. This effect does carries over to approval of the entire Congress, although

[11] Both approval questions are 4 point ordinal scales ranging from strongly approve to strongly disapprove. The questions have a natural splitting point between somewhat approve and somewhat disapprove. Models presented in earlier chapters used logistic regression in such situations, splitting the dependent variables into approve/disapprove items. In these cases, however, the results from the logistic regression differed greatly from a linear version. The models were re-estimated as ordered logistic regressions with standard errors clustered by congressional district and the results were very similar to the multilevel linear regression. A multilevel ordered logistic regression was attempted using Stata's GLLAMM program, but the model did not reach convergence.

[12] Since the policy divergence term was created as the absolute value of the difference between the respondent's self placement on a 100pt liberal-conservative continuum and the respondent's placement of his or her representative on the same scale, the variable ranges from 0 (no divergence) to 100.

with a smaller substantive effect.[13] The negative relationship between constituency size change and approval should not be surprising: population growth places demands on legislators. After all, they have resources and staff requisite to represent their district's population at the beginning of the decade. Some districts grew from 200 to 2008 by 50%, or 300,000 constituents. Even the most adept members of Congress may need to learn different strategies to reach these new constituents and gain their support. A 100,000 person increase in constituency size is predicted to reduce approval of the representative by .04 points and the approval of Congress by .02 points on a 4-point scale. Substantively, a 100,000 person change in constituency size has the same predicted effect as having a representative with 6 2/3 years experience in the House on representative approval and 10 years of experience on Congressional approval.

The results in Table 6.3 do not show much support for the role of geographical districting principles, however. Neither coterminousness nor compactness is significantly related to approval of either members or Congress. In general these results confirm the bivariate results presented in Tables 6.1 and 6.2: as at the state legislative level, approval of representatives decreases as constituency size grows. Further, the models reinforce the null relationship between geographic districting principles and approval at the congressional level.

The control variables largely conform to expectations. Respondents from districts represented by experienced House members are more likely to approve of their House members, as well as the Congress. Urban respondents are significantly less likely to

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[13] Unlike other findings presented here, this result is dependent on the modeling technique used. Change in constituency size reaches statistical significance if the un-collapsed four-point approval scale is used.

approve of their representatives, controlling for other factors. No other aggregate variables reach statistical significance.

Respondents who are of the same party as their representative are more likely to report approving of their House member's job performance. Likewise, Republicans are significantly less likely to approve of the 110th Congress with its large Democratic majority. Democratic respondents, on the other hand are significantly more likely to approve of the Congress. These partisan effects support the literature on electoral winners (Anderson and Guillory 1997; Anderson and LoTempio 2002). Similar findings by Brunell form the basis of his argument supporting purposeful partisan gerrymandering to increase support for members of Congress (2008). Partisans whose representative is from a different party are significantly less likely to approve of their representative. Women are significantly more likely to approve of their representatives and Congress than men are, and age is positively related to approval of representatives but negatively related to approval of Congress.

Descriptive representation also finds support in Table 6.3. Respondents whose House member shares their race are significantly more likely to approve of their House member, although a null relationship exists between congressional approval and dyadic descriptive representation. Racial minorities also more greatly approve of their representative then do whites, even when controlling for descriptive representation, as shown by the positive and significant coefficients on the black, Hispanic, and Asian indicator variables. Blacks and Hispanics, perhaps since they are support the Democratic Party at high rates, also approve of Democratically-controlled Congress.

6.5.2 Communication and Information Transmission

While Table 6.3 is only supportive of the effect of constituency size, the results for the communication and information transmission models in Table 6.4 show substantial support for the theory. The first column presents the multilevel logistic regression of whether the respondent reported having contacted his or her representative. All three district characteristic measures are statistically significant and in the expected direction: growth in constituency size is negatively related to having initiated contact, while compactness and coterminousness are both positively related to contact.

This finding related to constituency size and constituent-initiated contact reinforces previous research on constituency size. Work on the Senate (Hibbing and Alford 1990; Lee and Oppenheimer 1999) has found the same relationship between state constituency size and contact, as has Frederick's (2007, 2009) work on U.S. House constituency size. But all of these sources have relied on ANES data, which have unfortunately small sample sizes in some states and very small sample sizes in most congressional districts. Further, since the survey question asked respondents whether they or someone in their household contacted their representative, the question taps citizen-initiated contact: high constituency sizes *discourage* respondents from contacting their elected representatives in the people's house

The empirical literature on geographic and traditional districting principles to date has found little evidence that such principles matter for representation. Only two studies have examined measures of compactness and coterminousness in the same model, and both studies found largely null results (Altman 1998a; Engstrom 2005). But both districting principles are significant and positively related to contacting the respondent's

House member: greater compactness and greater coterminousness is associated with higher levels of citizen-initiated contact with their representative. These findings provide support for the expectation that complex and unrecognizable district boundaries may make it difficult for residents to place themselves within the districting system. Compact boundaries, which are marked by regular, dispersed shapes (like a square or a circle) as well as simple (as opposed to complex or jagged) boundaries should reduce the costs needed to contact representatives, since they make it easier to identify the district of residence. Likewise, districts with boundaries which are coterminous with county or city boundaries should also reduce the information needed to place oneself within the system of districts.

Similar findings are presented in the second and third columns of Table 6.4. The models show the results from the regression of whether respondents correctly identify their representative's party and race on the same list of covariates. Respondents residing in congressional districts with high growth in constituency size are significantly less likely to be able to correctly identify their representative's party and race. Apparently, the communication difficulties presented by more constituents per district leads to less information, even the most basic information like partisanship and race, being communicated successfully to constituents. Again, this finding makes sense in light of previous research on constituency size. Not only does Frederick (2007, 2009) find less constituent-initiated contact with representatives, but his survey respondents also report less representative-initiated contact. In other words, higher constituency sizes make the representative's job of communicating information about herself difficult, fewer constituents are reached by her outreach efforts, leading to more poorly informed

constituents. Importantly, the CCES was conducted in October of 2008, in the height of 2008 general election cycle, when information about candidates should be high.

Geographical compactness is also statistically significant and correctly signed in both party and race models. Residents in compact districts are significantly more likely to correctly identify their representative's party and race than are residents in non-compact districts. Again, this finding fits nicely with the theory: complex districts make it more difficult for constituents to identify their district – if residents do not know their district, political advertisements and outreach efforts cannot successfully convey information about candidates.

The results in Table 6.4 are slightly weaker for coterminousness. The districting principle is significant and positive for the party recall model ($p<.07$) but just exceeds conventional significance levels for the race recall model ($p=.103$, two-tailed test). Substantively, however, these results are also in support of the theory. District boundary location matters: when boundaries are drawn in reference to pre-existing political subdivision boundaries, residents learn more information about their congressional representatives, supporting similar findings by Winburn and Wagner (Forthcoming).[14]

Given the use of logistic regressions in most of the above models, coefficient values cannot be used to directly estimate the substantive magnitude of the statistically significant effects. Two sets of difference in the predicted probability of the various dependent variables are presented by each of the three key independent variables in

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[14] Previous research has measured the extent to which district boundaries are drawn with respect to subdivision boundaries either as district-county area congruence (Engstrom 2005; Winburn and Wagner) or whether the district splits subdivisions (Altman 1998a; Winburn 2009).

Figure 6.3. Each bar of the figure represents the change in the probability of the dependent variable occurring, either with a difference of one standard deviation below the mean to one standard deviation about the mean or from the minimum to maximum value. The first differences were calculated only for statistically significant coefficients.

The model predicts growth in constituency size to have moderate effects on citizen-initiated contact. A one standard deviation below the mean to one standard deviation above the mean (about a 130,000 person increase in constituency size) results in a 2 percentage point decrease in the likelihood a hypothetical respondent will report having contacted his or her representative. When considering the whole range of change in constituency size, the difference in predicted probabilities results in just under 6 percentage point decrease in the probability of contact. Boundary characteristics show a stronger substantive effect. The -1 s.d. to +1 s.d. change on coterminousness (from .48 to .91) is associated with over a 3 percentage point increase in contact, a similar change in compactness results in a 2 point increase. Minimum to maximum shifts on coterminousness and compactness are predicted to result in 7.1 and 7.4 percentage point increases in contact, respectively.

Similar effects of boundary characteristics are found on the other two information transmission items: whether the respondent can correctly recall their representative's party and race. The -1 to +1 s.d. change on coterminousness is associated with a 3 percentage point increase in party recall, while the minimum to maximum change is predicted to have a 6.8 point positive influence. A slightly stronger effect is identified for compactness on party recall: the -1 to +1 s.d. shift is associated with a 3.6 percentage point increase and the minimum to maximum change results in a 11.4 percentage point

increase in party recall. Smaller effects are identified for compactness and race recall (2.4 and 7 percentage point increases for the two shifts). Change in constituency size has the largest effects on party and race recall: moving from a slight decrease in constituency size (-13,000) to an increase of 104,000 residents is predicted to have a 5.5 point decrease in party recall and a 4.5 point decrease in race recall. Minimum to maximum changes for both dependent variables is associated with a 19 point decrease in the probability of recall, the largest effects identified for any of the district characteristics.

6.5.3 Service, Policy, and Allocation Responsiveness

Districts certainly influence constituents-legislator communication, but do they affect responsiveness, broadly construed? Here the evidence is more mixed. Coterminousness is the only district characteristics significantly related to service responsiveness. Residents from districts with high coterminousness are more likely to report being satisfied with the response received when contacting their House member. Substantively, a -1 to +1 s.d. increase on coterminousness is predicted to increase the probability of being satisfied by 3.7 percentage points, while a minimum to maximum change results in a 8.5 point increase, according to the model (Shown in Figure 6.3).

Do district characteristics influence policy representation? The second model in Table 6.4 shows the regression of the difference between citizen and representative ideology (as reported by respondents) regressed on the district characteristics and control variables. None of the three district characteristics variables reach statistical significance.

Again, the multivariate results bear out the null relationship found in the bivariate analysis. [15]

Competition in House races is associated with lower policy divergence – in other words, respondents perceive their members to be closer to their stated ideology point if their district experiences a competitive election. Experienced representatives also appear to lead to less policy divergence; seniority is significantly associated with lower amounts of perceived policy divergence. Finally, urbanism is associated with greater perceived ideological divergence, which is not surprising since urban areas are associated with higher diversity on a number of factors. Electoral winner status and descriptive representation is associated with less divergence, while partisans report significantly higher levels. Male respondents perceive significantly greater policy divergence between their views and their representative's than do women, while education is associated with greater divergence as well. Racial minorities report less divergence.

However, all three district characteristics are significant predictors of allocation responsiveness and are signed in the expected, (by now familiar) directions.[16] A growing

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[15] These null results are particularly unsurprising for the geographical districting principles. Gerrymandered districts, either partisan or racial, may lead to decreased ideological policy divergence. Brunell (2008) and Buchler's (2005) arguments for purposefully uncompetitive (gerrymandered) districts are based on this very reasoning: by packing like-minded residents into the same districts, more people will be electoral winners at the congressional level and should see less overall policy divergence between their views and their representative's. Compactness and coterminousness, because they do not necessarily group ideologically-similar individuals together for representation, may actually increase divergence if adopted in previously gerrymandered areas.

[16] The allocation responsiveness question is not ideal: since the question asks about whether the respondent recalls a project brought to the district by the representative, the item contains both a communication/information component (recall) and an allocation component (project). Yet, both components are critical: representatives not only try to get funding for projects in their districts and support the local economy in any way they can, they also seek inform residents of their actions on behalf of the district.

constituency size is associated with lower recall of successfully bringing a project to the district, similar to Lee and Oppenheimer's (1999) evidence that residents of small states place more emphasis on allocation responsiveness than do residents from large states. Compactness and coterminousness are both positively associated with greater allocation responsiveness, either because open communication channels lead to greater information transmission about the representative's work in the district or because geographically compact and districts with high coterminousness make allocation more important. Compact districts and district with boundaries that follow subdivision boundaries should make allocation activities more necessary for representatives: both districting criteria should result in stronger influence for geographically centralized or community-based interests (like local chambers of commerce and city governments). Substantively, district characteristics seem to have only marginal effects on allocation responsiveness: a -1 to +1 s.d. change on each district characteristic leads to between a 1 to 2 point change in the likelihood of recalling a project brought to the district. The probability of such a recall, however, is very low to begin with (14% of respondents report recalling a project brought to the district).

As in many of the previous models, seniority of the representative and competitiveness of the House race both are significant and positive predictors of allocation responsiveness. Respondents from districts with long-serving members are more likely to recall a project brought back to the district. Two mechanisms may be at work here. First, long-serving members have had more time to bring projects to the

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The results this item regressed on the set of explanatory variables is presented in the final column.

district, which could account for this effect. Second, with seniority come positions of influence. Those members who served in the House for years may be better able to secure funds and projects for the district, since they tend to have powerful committee positions, not to mention the relationships needed to secure such district benefits. Incumbents may spend more time and money convincing residents of their activities to benefit the district when involved in competitive races, resulting in the positive relationship unearthed in Table 6.4.

Do district characteristics combine to influence representation, or do cross-cutting effects across the characteristics result in relatively little change on the dependent variables? To illustrate the effects of all three district characteristics using real combinations of the independent variables, predicted probabilities of the three communication/information transmission variables were calculated for each congressional district. All control variables (both individual and congressional district level) were set at median or modal values except for the district characteristic variables. Those variables were set to their actual 110th Congress values. Random intercepts for the congressional districts were set to 0. These predicted probabilities thus give a glimpse at the predicted difference in key dependent variables due to the actual combination of values on the three district characteristics, holding everything else constant. Box plots of predict contact, party recall, race recall, and allocation responsiveness are shown in Figure 6.4.[17] Constituency size, coterminousness, and compactness combine to account

[17] A box plot is a graph type used to analyze the distribution of a variable. The colored bars in the center of the plot show the 25th to 75th percentiles, while the parallel lines (called whiskers) past the colored bars denote the closest observed value to one step * 1.5, where a step is the difference between the 25th and 75th percentiles. Outlying cases beyond the whiskers are marked with dots.

for over a 15 point change in the probability of contacting a House member and over a 25 percentage point changes in the probability a hypothetical respondent correctly recalls the party of the respondent, with a similar effect found for race recall. Finally, a 10 percentage point differentiation on allocation recall is identified due to observed differences in district characteristics across congressional districts.

The evidence presented here shows that district characteristics influence both evaluations of representative and Congress as well as constituent-legislator communication. The theory, however, stipulates that not only are communication and linkage important in its own right, a greater degree of constituent-legislator contact and communication should lead to more positive evaluations. This theory is tested in a series of models presented in Table 6.6. The models are replications of the random-intercept multilevel linear regressions presented in Table 6.3. The models regress approval ratings of House members and Congress on the same covariates used throughout the chapter and include some of the dependent variables of Table 6.4 and 6.5 as independent variables.

Communication and information transmission variables are associated with higher approval ratings of House members. Initiating contact with House member, recalling the race of the representative, and recalling a project the representative brought to the district are all significantly and positively related to job approval ratings. The model also shows support for the notion that constituency size influence representative approval through the communication and information transmission mechanisms: after accounting for these variables, change in constituency size is not significantly related to representative approval.

These findings stand in contrast to the congressional approval models shown in the second two columns of Table 6.6. The third model includes approval of the representative as a covariate, while the second does not. While the communication and linkage variables are also significantly associated with approval, the direction of the relationship is negative: respondents who have contacted their representative are less likely to approve of Congress. The exception is recalling a project brought to the district, or allocation responsiveness. Respondents who recall a project show higher approval levels.

Why do communication and linkage measures decrease congressional approval? One possibility is that a stronger representative-constituent connection makes clearer to constituents the failures of Congress. After all, respondents' opinions of Congress are dominated by opinions of other members of Congress (J. R. Hibbing and Theiss-Morse 1995), and information about other members contains many examples of failed representation: scandals, pork-barrel politics, and vote trading. A strong representational relationship, then, may simply highlight the failures of other members, and therefore highlight the representational problems of Congress. Interestingly, growth in constituency size is still associated with lower congressional approval, even when controlling for communication and approval of House members, suggesting a constituency size effect independent of communication and information transmission.

6.6 Discussion

This chapter has provided extensive evidence of legislative district effects. Constituency size is an important predictor both representative and Congressional approval. All three district characteristics significantly influence communication between

constituents and legislators, an integral part of the representational relationship. Without open communication channels, constituents cannot inform representatives about their opinions and expectations, and representatives cannot inform voters about their work on behalf of the district. According to Malcolm Jewell (1982), communication is central to representation; representatives think of communicating with and educating the public, as well as being accessible to constituents' efforts to communicate to them, as key parts of their job as representatives. Likewise, the findings regarding allocation responsiveness suggest the importance of coterminousness: constituent service, or responding to citizen requests for assistance or accessibility, is not only a considered a component of responsiveness by Eulau and Karps (1977), it has also long been known to be one of the most important aspects of a representative's support in the district (Parker and Davidson 1979).

This chapter has provided strong evidence districts influence the representational relationship. Both constituency size and districting principles matter for linkage, but they do so in different ways. Three points stand out about these results. First, substantial evidence has been presented in this chapter to show that large constituency sizes strain the representational relationship at the congressional level. Respondents are significantly less likely to report contacting their representative, recalling their representative's party and race, and recalling a project the representative brought to the district. In other words, large (and growing) districts see less constituent-initiated communication with representatives and respondents from such districts remember less basic, fundamental information about their representatives. The effects of constituency size are largest for recalling information like the representative's party and race. Further, a growing

constituency size carries over into evaluations of both the representative and Congress as a whole: more constituents result in lower approval for the representative and lower approval for the Congress. These findings largely confirm previous research while utilizing a much larger dataset (2008 CCES) and multilevel modeling. More importantly, they substantially reinforce the theory that scale matters for representation suggested by many researchers and observers since the Anti-Federalists made the argument at the nation's founding.

Geographical districting principles also influence the representational relationship. Although already playing an important legal role in redistricting, the previous research has found little evidence that districting principles directly influenced representation. The results presented here are the strongest evidence to date of a districting effect. This effect lies primarily with communication, as the theory suggests. Complex district boundaries, either due to boundary shape or the arbitrariness of boundary locations, reduces the likelihood of constituent-legislator communication, and respondents clearly remember less information about their representatives when district boundaries are complex. Further, coterminousness is importantly connected with service responsiveness: perhaps due to less fragmented counties and communities, unifying the local and congressional political communities may make it easier for representatives to adequately address the concerns raised by constituents.

Finally, although meaningful and wide-ranging effects of district characteristics have been identified in this chapter, it is important to note that these characteristics are not some sort of representational panacea. Citizens do not perceive their representative to be closer ideologically to their own preferences in smaller, more compact, or more

coterminous districts. The role districts seem to play in the representational relationship is not along the broad left-right dimension in American politics. Policy congruence effects are noticeably absent from the evidence presented here. Future research on district characteristics may find greater district effects on the more linkage-oriented measures of representation, like communication, constituent service, and district funding.

Table 6.1 Mean Comparison of Approval, Communication and Information Transmission and Responsiveness, by Constituency Size Quartile

	Approval		Communication			Responsiveness		
	Rep.	Congress	Contact	Party Recall	Race Recall	Service	Policy	Allocation
Constituency Size								
1	.640	.218	.349	.723	.843	.700	29.792	.196
2	.606	.201	.352	.709	.833	.692	31.367	.171
3	.617	.197	.356	.702	.840	.688	29.046	.169
4	.594	.176	.335	.678	.799	.680	30.204	.150
Max-min	-.046	-.041	-.014	-.045	-.044	-.019	.412	-.046
Change in Constituency Size								
1	.636	.215	.356	.716	.845	.697	29.909	.189
2	.624	.204	.343	.704	.838	.689	30.196	.181
3	.610	.194	.373	.714	.849	.702	30.256	.173
4	.587	.179	.322	.676	.785	.670	30.056	.143
Max-min	-.050	-.036	-.034	-.040	-.060	-.027	.146	-.046

Source: 2008 Cooperative Congressional Election Study. Service responsiveness is the percentage of respondents who were satisfied with the contact they initiated with their member of Congress. Policy responsiveness is the average difference between a respondent's ideological placement on a 100pt scale and the respondent's placement of his or her House member. Allocation responsiveness is the percentage of respondents reporting they recalled a project their House member brought back to the district.

Table 6.2 Mean Comparison of Approval, Communication and Information Transmission and Responsiveness, by Compactness and Coterminousness Quartiles

	Approval		Communication			Responsiveness		
	Rep.	Congress	Contact	Party Recall	Race Recall	Service	Policy	Allocation
Compactness								
1	.607	.213	.324	.694	.788	.677	30.083	.158
2	.623	.202	.328	.673	.810	.699	29.513	.162
3	.607	.195	.361	.698	.835	.695	30.577	.169
4	.613	.178	.373	.735	.870	.686	30.219	.189
Max-min	.006	-.035	.049	.041	.082	.008	.137	.030
Coterminousness								
1	.614	.218	.302	.675	.756	.669	29.616	.134
2	.599	.200	.350	.710	.824	.685	30.365	.158
3	.614	.184	.356	.713	.854	.690	30.374	.176
4	.622	.186	.377	.704	.866	.707	30.048	.208
Max-min	.008	-.032	.075	.029	.110	.038	.432	.074

Source: 2008 Cooperative Congressional Election Study. Service responsiveness is the percentage of respondents who were satisfied with the contact they initiated with their member of Congress. Policy responsiveness is the average difference between a respondent's ideological placement on a 100pt scale and the respondent's placement of his or her House member. Allocation responsiveness is the percentage of respondents reporting they recalled a project their House member brought back to the district.

Table 6.3. Congressional District Characteristics and Approval (110th Congress)

	Representative		Congress	
	b	(s.e.)	b	(s.e.)
Congressional District				
Δ in Constituency Size	-.0004+	(.0002)	-.0002*	(.0001)
Coterminousness	.012	(.075)	-.001	(.028)
Compactness	.104	(.121)	-.059	(.044)
Compactness: State Border	.069	(.076)	-.018	(.027)
Seniority	.006**	(.002)	.002**	(.001)
District Competitiveness	.014	(.057)	.034	(.021)
Urbanism	-.351**	(.088)	.072*	(.033)
Racial Diversity	-.055	(.090)	.037	(.034)
Median Income	.002+	(.001)	.0003	(.0005)
Individual				
Republican	-.335**	(.023)	-.181**	(.016)
Democrat	-.420**	(.023)	.503**	(.015)
Same Party as Representative	1.185**	(.014)	.021*	(.009)
Same Race as Representative	.097**	(.019)	.016	(.013)
Male	-.116**	(.012)	-.140**	(.009)
Age	.004**	(.000)	-.005**	(.000)
Education	-.001	(.006)	.005	(.004)
Income	-.002	(.002)	-.011**	(.001)
Black	.161**	(.026)	.052**	(.017)
Hispanic	.088**	(.028)	.045*	(.018)
Asian	.157*	(.065)	.099*	(.042)
Union Member	-.005	(.014)	.021*	(.010)
Residential Mobility	.002	(.010)	-.011+	(.007)
Intercept	2.279**	(.115)	1.894**	(.048)
Random Effects				
Intercept	.049	(.004)	.0008	(.0006)
N	21990		27430	
R^2	.263		.226	
AIC	57794		58490	

Note: All models are random intercept multilevel linear regressions. Data source is the 2008 Cooperative Congressional Election Study.

+ p < .1, * p < .05, ** p < .01, two-tailed test.

Table 6.4. Congressional District Characteristics, Constituent-Initiated Contact, and Information Transmission (110th Congress)

	Contact		Recall Attribute of House Member			
			Party		Race	
	b	(s.e.)	b	(s.e.)	b	(s.e.)
Congressional District						
Δ in Constituency Size	-.001*	(.000)	-.002**	(.000)	-.004**	(.001)
Coterminousness	.364**	(.116)	.303+	(.167)	.351+	(.215)
Compactness	.461*	(.182)	.706**	(.270)	1.008**	(.355)
Compactness: State Border	.077	(.113)	.010	(.168)	.104	(.222)
Seniority	.025**	(.003)	.009*	(.004)	.011*	(.005)
District Competitiveness	.118	(.088)	.383**	(.127)	.637**	(.164)
Urbanism	-.117	(.134)	.741**	(.196)	.018	(.256)
Racial Diversity	.050	(.139)	-.036	(.200)	-.703**	(.258)
Median Income	-.002	(.002)	-.013**	(.004)	-.007+	(.004)
Individual						
Republican	.181**	(.049)	.771**	(.051)	.531**	(.060)
Democrat	.022	(.049)	.527**	(.049)	.450**	(.058)
Same Party as Representative	.240**	(.029)	.286**	(.034)	.132**	(.041)
Same Race as Representative	.127**	(.041)	.381**	(.045)	1.078**	(.048)
Male	.386**	(.027)	.771**	(.030)	.335**	(.036)
Age	.019**	(.001)	.032**	(.001)	.024**	(.001)
Education	.319**	(.014)	.439**	(.017)	.220**	(.020)
Income	.031**	(.004)	.079**	(.005)	.051**	(.006)
Black	-.517**	(.057)	.111+	(.058)	.019	(.061)
Hispanic	-.314**	(.061)	.080	(.062)	-.045	(.064)
Asian	-.446**	(.144)	-.216	(.134)	.020	(.136)
Union Member	.160**	(.030)	.071*	(.035)	-.013	(.041)
Residential Mobility	.286**	(.021)	.373**	(.022)	.431**	(.025)
Intercept	-4.475**	(.187)	-5.304**	(.259)	-3.111**	(.329)
Random Effects						
Intercept	.072	(.010)	.221	(.022)	.396	(.039)
N	29059		28999		29081	
AIC	34535		28874		21717	

Note: All models are random intercept multilevel logistic regressions. Data source is the 2008 Cooperative Congressional Election Study.

+ p < .1, * p < .05, ** p < .01, two-tailed test.

Table 6.5. Congressional District Characteristics and Responsiveness (110th Congress)

	Service		Policy Divergence		Allocation	
	b	(s.e.)	b	(s.e.)	b	(s.e.)
Congressional District						
Δ in Constituency Size	-.001	(.001)	-.006	(.004)	-.002**	(.000)
Coterminousness	.340+	(.205)	-.430	(1.471)	.356*	(.162)
Compactness	-.264	(.317)	-2.302	(2.322)	.644*	(.254)
Compactness: State Border	.205	(.198)	-1.643	(1.445)	-.216	(.161)
Seniority	.014**	(.005)	-.072*	(.034)	.025**	(.004)
District Competitiveness	.357*	(.156)	-4.112**	(1.111)	.324**	(.122)
Urbanism	-.551*	(.238)	6.731**	(1.702)	-.302	(.186)
Racial Diversity	-.066	(.246)	-1.583	(1.747)	-.219	(.192)
Median Income	.003	(.004)	-.038	(.027)	.016	(.003)
Individual						
Republican	-.582**	(.083)	19.497**	(.574)	.047	(.064)
Democrat	-.868**	(.084)	17.658**	(.575)	.016	(.064)
Same Party as Representative	2.138**	(.058)	-32.011**	(.334)	.457**	(.037)
Same Race as Representative	.058	(.076)	-1.499**	(.460)	.136**	(.052)
Male	-.352**	(.051)	1.216**	(.306)	.373**	(.034)
Age	.004*	(.002)	-.017	(.012)	.020**	(.001)
Education	-.041	(.025)	.502**	(.157)	.316**	(.017)
Income	-.001	(.008)	-.050	(.050)	.043**	(.006)
Black	.363**	(.120)	-3.818**	(.627)	-.087	(.071)
Hispanic	.086	(.119)	-1.787**	(.681)	-.059	(.079)
Asian	.779*	(.331)	-7.122**	(1.625)	-.388+	(.204)
Union Member	-.008	(.055)	.455	(.345)	.195**	(.037)
Residential Mobility	.028	(.042)	.013	(.245)	.214**	(.028)
Intercept	.283	(.333)	31.023**	(2.331)	-4.838**	(.257)
Random Effects						
Intercept	.195	(.031)	14.09	(1.62)	.168	(.021)
N	10206		21333		29041	
R^2			.308			
AIC	10870		192086		24492	

Note: First and third models are random intercept multilevel logistic regressions. Second model is a random intercept multilevel linear regression. Data source is the 2008 Cooperative Congressional Election Study.

+ p < .1, * p < .05, ** p < .01, two-tailed test.

Table 6.6. District Characteristics, Communication/Linkage Items, and Approval

	Representative		Congress			
			(a)		(b)	
	b	(s.e.)	b	(s.e.)	b	(s.e.)
District						
Δ in Constituency Size	-.0003	(.0002)	-.0002*	(.0001)	-.0002*	(.0001)
Coterminousness	-.003	(.075)	.0003	(.029)	-.024	(.034)
Compactness	.070	(.118)	-.049	(.045)	-.046	(.052)
Compactness: State Border	.082	(.074)	-.012	(.028)	-.012	(.032)
Seniority	.005**	(.002)	.002**	(.001)	.001	(.001)
Competitiveness	-.005	(.056)	.037+	(.022)	.039	(.026)
Urbanism	-.337**	(.086)	.080*	(.034)	.106**	(.039)
Racial Diversity	-.037	(.087)	.038	(.035)	.038	(.040)
Median Income	.003*	(.001)	.0002	(.0005)	-.002	(.006)
Individual						
Republican	-.339**	(.023)	-.173**	(.016)	-.145**	(.018)
Democrat	-.423**	(.023)	.507**	(.016)	.615**	(.018)
Same Party as Rep.	1.162**	(.014)	.024**	(.009)	-.115**	(.012)
Same Race as Rep.	.072**	(.019)	.024+	(.013)	.011	(.014)
Male	-.135**	(.012)	-.130**	(.009)	-.117**	(.010)
Age	.003**	(.000)	-.005**	(.000)	-.005**	(.000)
Education	-.020**	(.006)	.011*	(.005)	.017**	(.005)
Income	-.005*	(.002)	-.010**	(.001)	-.010**	(.002)
Black	.176**	(.026)	.046**	(.017)	.048*	(.019)
Hispanic	.106**	(.027)	.046*	(.018)	.030	(.021)
Asian	.172**	(.066)	.093*	(.042)	.067	(.050)
Union Member	-.010	(.014)	.023*	(.010)	.024*	(.011)
Res. Mobility	-.010	(.010)	-.004	(.007)	-.005	(.008)
Contacted Rep.	**.077****	**(.013)**	**-.070****	**(.010)**	**-.083****	**(.010)**
Party Recall	**.028**	**(.019)**	**-.062****	**(.012)**	**-.078****	**(.014)**
Race Recall	**.167****	**(.025)**	**-.010**	**(.014)**	**-.032+**	**(.019)**
Project Recall	**.248****	**(.015)**	**.057****	**(.012)**	**.020+**	**(.012)**
Rep. Approval					**.123****	**(.005)**
Intercept	.283	(.333)	31.023**	(2.331)	-4.838**	(.257)
Random Effects						
Intercept	.045	(.004)	.0011	(.0006)	.003	(.001)
N	21746		27070		21220	
R^2	.279		.231		.284	
AIC	56746		57567		43655	

Note: All models are random intercept multilevel logistic regressions. Data source is the 2008 Cooperative Congressional Election Study.

+ p < .1, * p < .05, ** p < .01, two-tailed test.

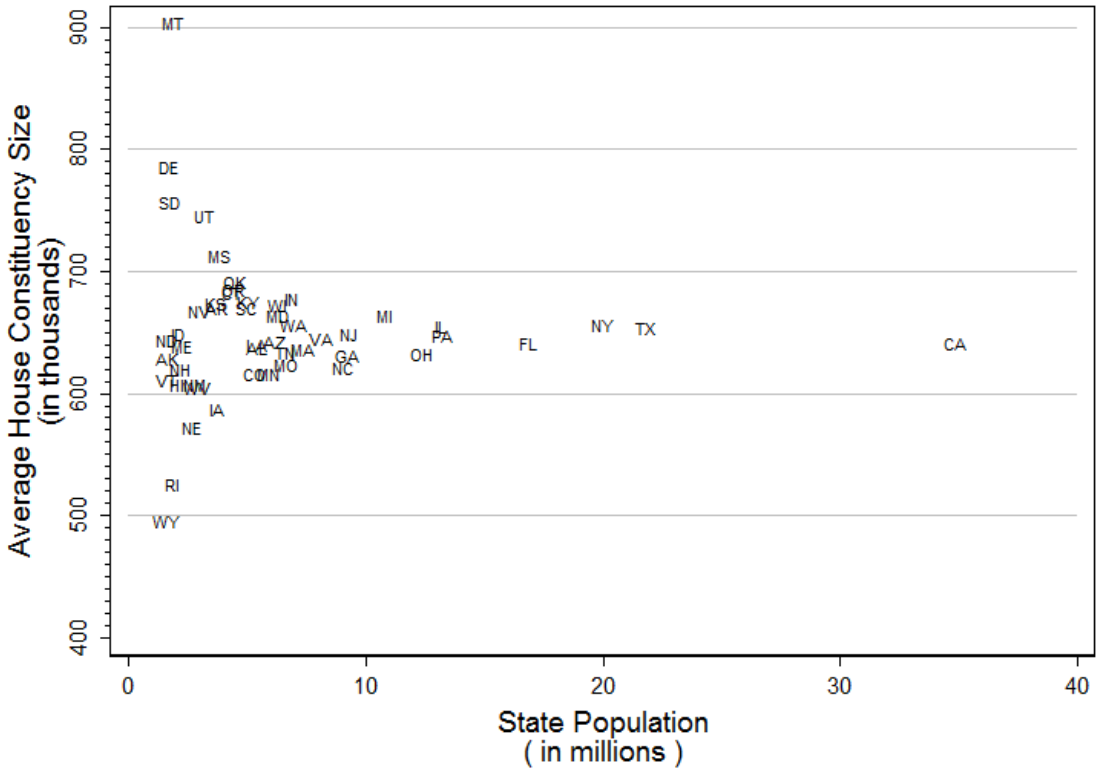

Figure 6.1. Average Constituency Sizes of Congressional Districts by State Population

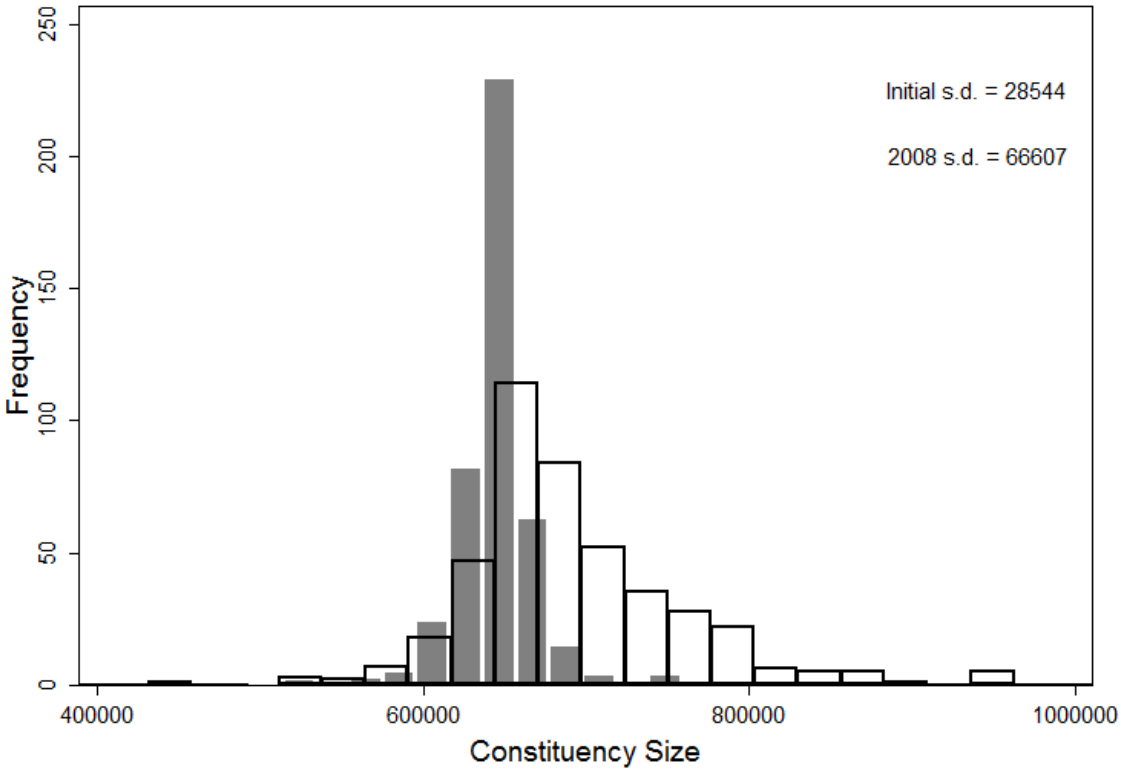

Figure 6.2. Histograms of constituency sizes, 2000 and 2008. Hollow bars show 2008 histogram.

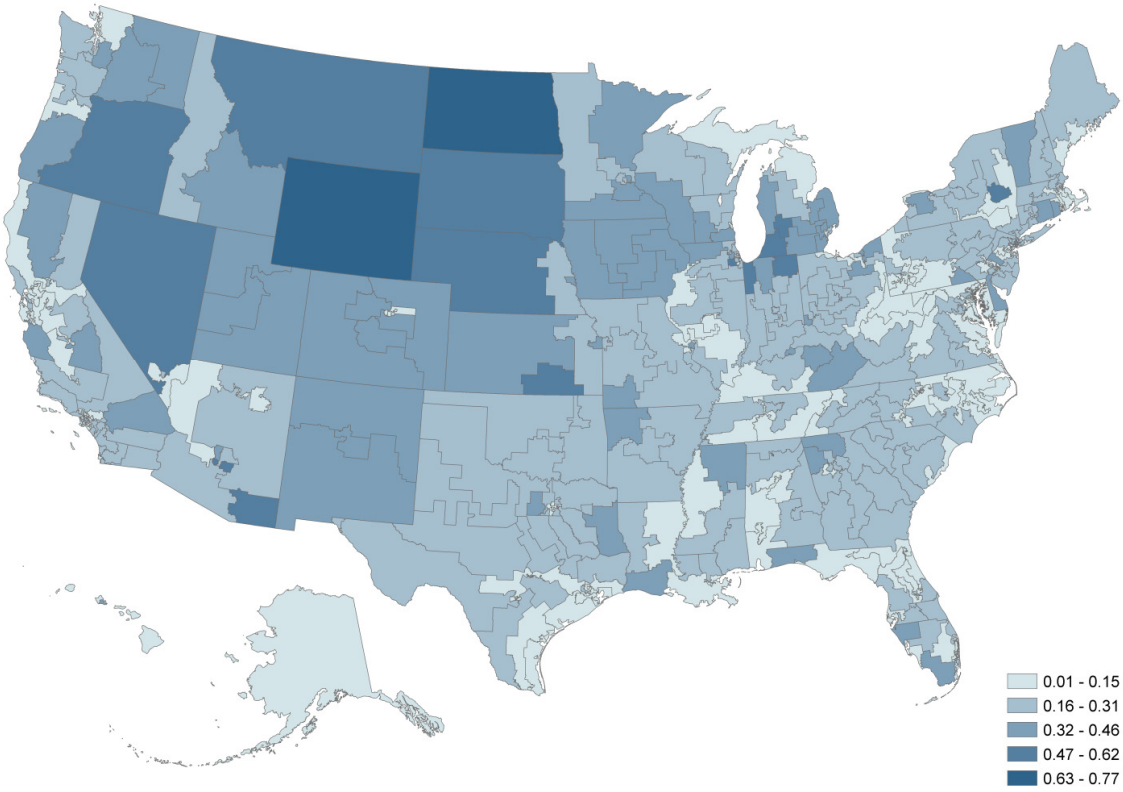

Figure 6.3. Geographical Compactness of U.S. House Districts, Post-2000 Redistricting

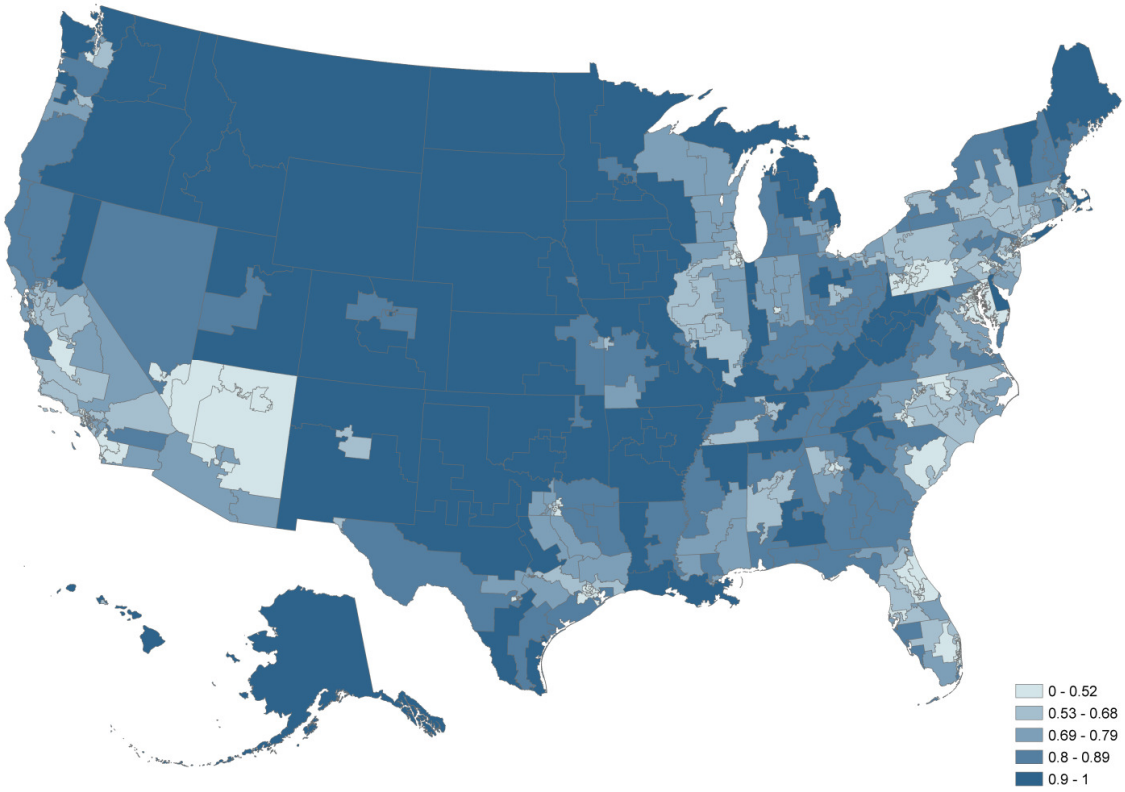

Figure 6.4 Boundary Coterminousness of U.S. House Districts, Post-2000 Redistricting

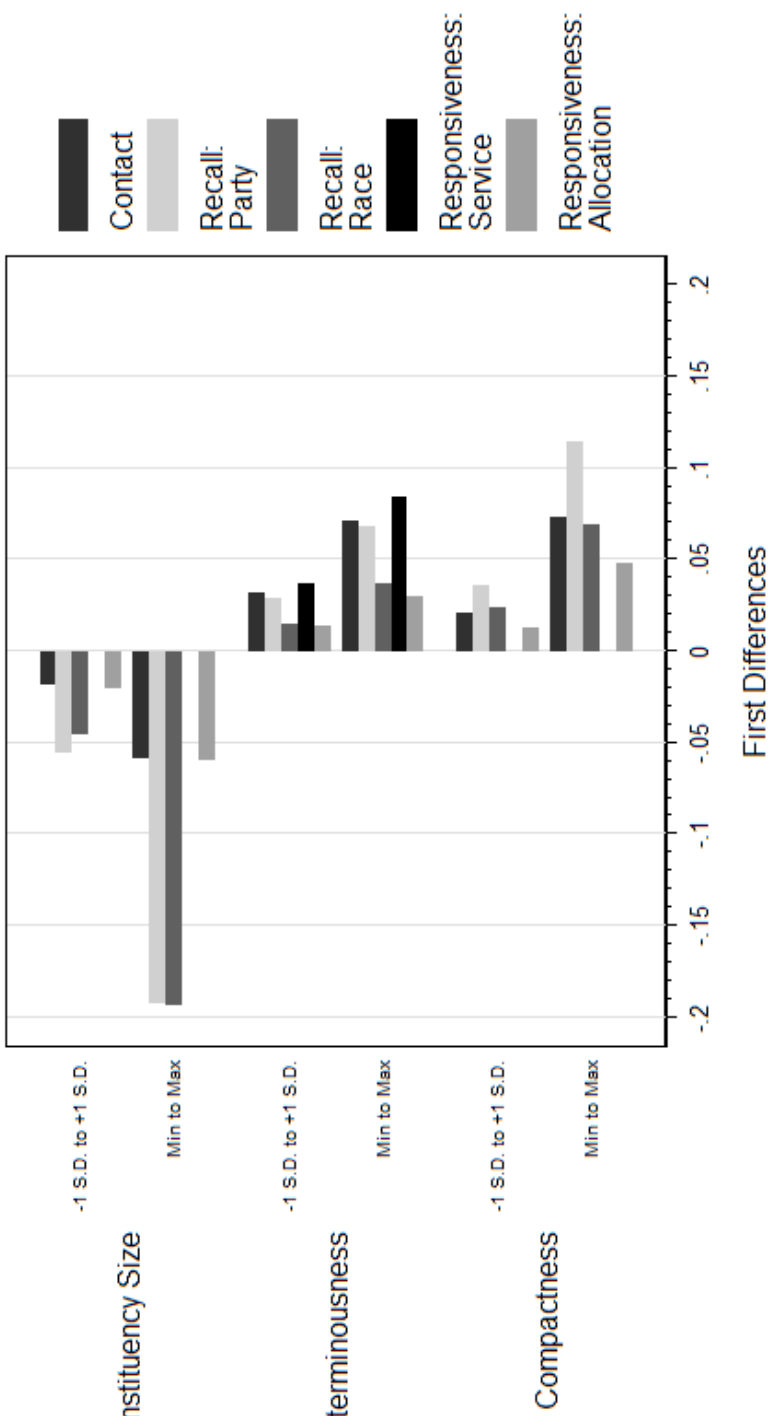

Figure 6.5. First Differences in Probability of Representational Items by District Characteristics

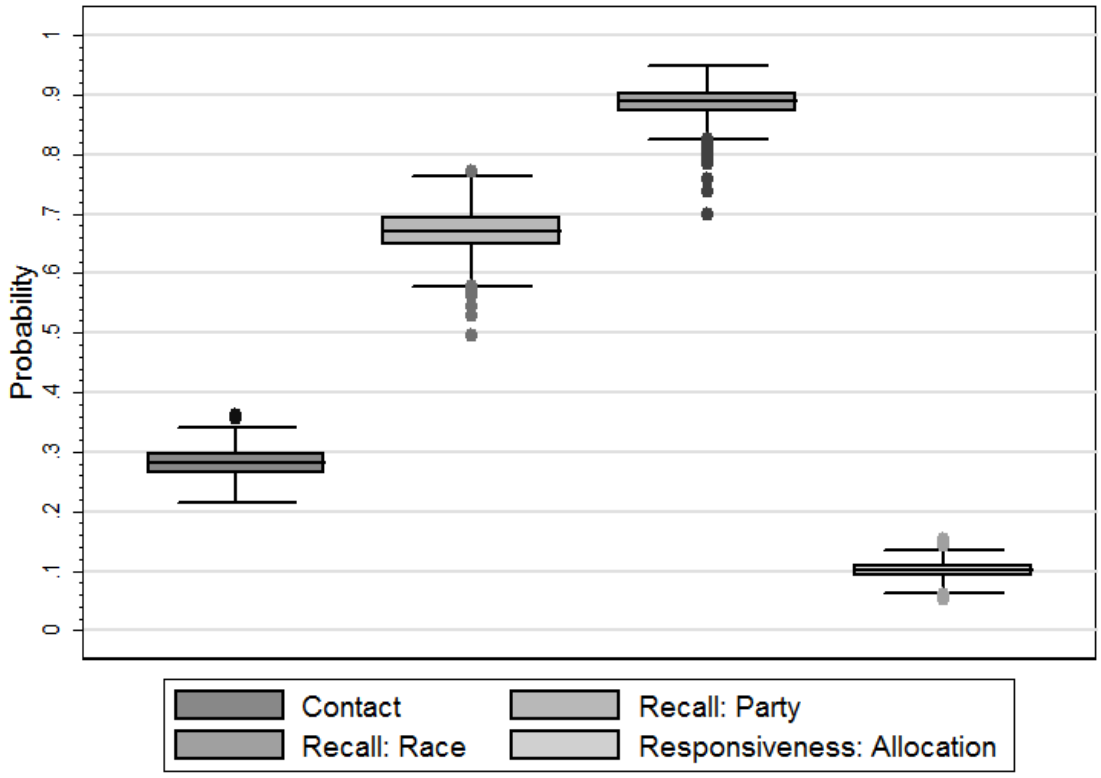

Figure 6.6. Box Plot of Predicted Influence of District Characteristics (Combined) on Representational Items

CHAPTER 7. NARROWING THE GAP: DISTRICT CHARACTERISTICS AND REPRESENTATIONAL DISTANCE

Districting is complex, both from a political and theoretical perspective. Drawing districts inherently involves key questions of representation: how should individuals be aggregated for representation? What interests and characteristics of the public deserve representation in the legislature? What goals should be forwarded by the districting system – both at the dyadic level and collective level? What principles are key to representation and (or) accountable and responsible governance? Any combination of lines drawn will benefit to some extent one set of answers to these questions over others.

This work has examined three district characteristics – constituency size, compactness, and coterminousness – and their influence on representation as experienced by constituents. The evidence marshaled in the previous chapters has shown that these characteristics can and do influence the relationship between constituents and legislators and therefore the evaluations of that relationship which citizens give their legislators, legislative institutions, and governments. The influence on the relationships tend to be in a common direction: district characteristics which increase the distance between constituents and their representatives lead to a weaker relationship, as defined by evaluations and the type and extent of constituent-legislator communication.

This makes sense in the context of geographic districts. The American representational system is predicated upon territorial legislative districts. Residents are grouped together for representation based on location of residence – if they reside within a district's boundaries, they are assigned to that district and then may participate in selecting legislators to represent the people and interests of the district. But what happens

when districts are drawn to reduce this connection with place? Geographical districts lose some of their value as a way of delivering representation in the context of a clearly defined, accountable relationship between a legislator and his or her constituents.

Changes during the last half-decade in American districts and districting have weakened the geographical design of districts. Larger constituency sizes reduce the distance between the median voter of a district and the median voter of state. More residents mean greater within-district heterogeneity, washing over local variation, which gives representatives greater freedom to ignore local interests or to play local interests off one another. This is, of course, Madison's exact argument in the Federalist 10 for the benefit of a large republic. Size can overcome "factions" because no group is large enough to control the other groups. But part of the point of the legislature is to give voice to the varied groups in the population. Large constituency sizes lump varied groups and interests in the same district, masking the real variation of the population, and disallowing those groups the ability to elect their own representatives.

Further, large constituency sizes create representational distance between the people and their elected representatives by increasing the communication and workload demands on the legislator. The only way for representatives to effectively respond to constituent requests for service and attention, when constituency size is large, is through the use of staff as intermediaries. This, however, isolates the representative from the experiences of his or her constituents, particularly in the eyes of the constituents. Few of them can ever interact directly with the representative, nor can they reap the informational benefits of direct contact. Rapid population growth during the last half-century has pushed and will continue to push the issue of constituency size, both in

conversations about the U.S. House of Representatives and in state legislatures of large and growing states like California, Texas, and Florida.

Similarly, the geographical districting principles of compactness and coterminousness influence the proximity of the representative to his or her constituents. The location of boundary lines directly determines the relationship between place and representation. Boundaries can be drawn in such a way as to unify local interests within a district by grouping geographically proximate residents together and keeping counties and municipalities intact. Boundary lines could also be drawn in such a way as to minimize the importance of geographical residence by breaking up cities and counties into multiple districts and aggregating citizens who bear no geographical relationship to each other – be it through geographical proximity or community of residence – into the same district. Such a grouping usually puts forward a different idea of representation, where individuals are aggregated because of their predicted party affiliation or race.

Creating noncompact districts with noncoterminous district boundaries creates complexity in the districting system, making it more difficult for citizens to place themselves within that system, and increasing representational distance between voters and their representatives. Such districts reduce constituent-initiated communication with representatives, the amount of direct, in-person contact with legislators and legislative candidates, and the amount of known information about the representative. These effects are clear and strong at the congressional district level and are suggested by the state legislative district analysis. Compact districts which follow preexisting subdivision boundaries, however, generally lead to a closer constituent-legislator relationship.

7.1 Summary of Findings

These arguments are supported by the empirical results presented earlier. Table 7.1 shows the findings from the congressional level empirical analysis presented in Chapter 6. Constituency size is negatively related to approval ratings of both Congress as a whole and respondents' individual House members. Respondents from districts with larger constituency sizes also report lower levels of constituent-initiated contact, less knowledge of basic information about their representative, and are less likely to say their representative secured funding for a district project. The population change from 2000 to 2008 was enough to produce such findings, underscoring the importance of constituency size effects for the House of Representatives, which hasn't seen an increase in the number of seats for over 90 years.

The results shown in Table 7.1 also affirm the role of geographical districting principles. While the analysis does not reveal a connection between the principles and approval ratings of either individual representatives or Congress, a clear relationship exists between them and the communication/linkage measures of contact and information recall. Further, residents from districts with coterminous boundaries are more likely to say they were satisfied with their representative's response when they contacted their House members. Finally, both compactness and coterminousness are associated with a greater likelihood of recalling a project brought to the district by the representative.

Table 7.2 displays the findings from the state-level empirical analyses in chapters 4 and 5. Constituency size has a wide-reaching effect on the way residents experience representative government in the states. Respondents from states with a higher average constituency size report less trust in state government (although this relationship fails to

reach statistical significance in some of the surveys analyzed) and are less likely to say they have a favorable opinion of state government. Large constituency sizes are also associated with lower approval ratings of the legislature and reduced perceptions of the responsiveness of the legislature to opinions of the state. This pattern is found at the dyadic level as well, with respondents from states with higher constituency sizes being less likely to say their representative is responsive to the district and less likely to have met their representative in person. Compactness, however, is not related to any of the items shown in Table 7.2. Coterminousness is significant and positively related to perceived responsiveness of the representative and whether the respondent has met his or her representative or legislative candidate in person. The finding pertaining to coterminousness, while suggestive of a districting principle effect, are limited to one survey.

The broad effects of constituency size are clear from these two tables. But why does the role of districting principles receive such little support in the state level analyses, particularly in light of the congressional district level findings? There are three possible explanations. First, geographical districting principles may influence communication and linkage items but not general evaluations of government or institutions. This explanation fits well with the data. Even at the congressional district level, where substantial support is found for the influence of districting principles, higher levels of compactness and coterminousness do not lead to higher House member or Congressional approval. The null findings shown in Table 7.1, then, may have more to do dependent variables analyzed than in differences in the role of compactness and coterminousness. The state-level models rely on measures of aggregate or collective representation: trust in state

government, approval of the state legislature, opinions of the state government, and responsiveness of the legislature. Most surveys simply do not ask questions regarding the connection between respondents and their state legislators, which is where a districting principle effect is most likely to be found.

A second explanation lies in the difference between congressional and state legislative representation. House of Representatives seats are high profile positions with decent exposure inside the district. State legislative seats, however, are not highly sought after positions in many states, as is shown by the greater occurrence of uncontested legislative races at the state legislative level than at the congressional level (Squire 2000). The informational environments of elections in the two seat types are also quite different, with greater news coverage and advertising available for congressional races than state legislative ones. Perhaps the effect of districting principles is only observable in high information settings.

Finally, measurement error may be confounding the findings. Since no state legislative district geo-codes exist for the surveys used in Chapter 5, the analysis was based on matching constituents to legislative districts using reported zip codes and zip code tabulation areas (ZCTAs). ZCTAs were created based on census block data from Census 2000. But zip codes change over time for purposes of mail delivery. Further, state legislative districts may or may not overlap closely with zip codes or ZCTAs; in most cases, the ZCTAs cross multiple legislative districts. There are thus two sources of error in assigning legislative districts to survey respondents: the translation of zip codes into ZCTAs after eight years of population growth and change and the matching of ZCTAs into legislative districts. This measurement error may be a cause of the null effects.

These explanations underscore the need for better survey data. The only way to sift through these potential causes is to conduct surveys which include geo-codes for state legislative districts and which ask respondents about their attitudes toward and connection with their individual state legislators. Such data are needed to fully understand the role districting principle play in the representational relationship at the state level.

7.2 Implications for Legislative Districts and Redistricting

What makes a "good" system of districts? Or, what needs to be encouraged in districting plans in order to improve representation in American legislatures? The answer to this question is inextricably linked to perceived representational problems. In the 1960s, the serious overrepresentation of rural residents at the expense of urban and suburban ones through gross malapportionment of legislative districts was an obvious impediment to fair representation in the states. The solution was equally obvious: districting plans should ensure equal populations across districts. Reforms, however, can have unintended consequences. The legislative professionalism movement of the 1970s, rising from the need to increase the institutional capacity of the legislature to deal with the complexities of modern government, spawned the term limits movement, aimed at ending the tenure of career legislators, just two decades later (Kousser 2005).

Legislative districting is ultimately about how individuals should be aggregated to present and defend their interests in the legislature and in front of the rest of the polity. In other words, districting is about representation. Changes in districting and the districting process thus involve changes in representation, and are driven by perceived shortcomings of the current system and ideals of what defines proper and fair representation. The

diagnosis of current representational ills will accordingly define the changes sought and therefore the districts produced. Both the diagnoses and remedies are frequently contradictory, as is clear from the juxtaposition of the professionalism and term limits movements. Any discussion of changes to the redistricting - either the process of drawing or the types of districts drawn – needs to involve assessments of the representational situation, since the remedy will necessarily be tied to the diagnosis.

The numerous districting criteria used (or proposed for use) across the states illustrate this point. Is party polarization and extremism the problem? Then perhaps districting commissions should use the location of incumbents' residences and the preservation of district cores, since both criteria increase the visibility of legislators within their districts and may increase the incumbency advantage, weakening the role of party in elections. Or perhaps uncompetitive elections are the problem, resulting in legislators unresponsive to constituent demands and subjugating minority partisans to districts in which they can never win? This diagnosis would involve entirely different (and contradictory) remedies from the above situation: incumbent protection gerrymanders are the evil to be prevented and district boundaries should be regularly altered in order to weaken the influence of incumbency and make legislators more vulnerable to changes in public opinion. The point is that districting is a complex process touching on the most essential elements of representation in American legislatures, and redistricting reforms will reverberate through the districting system in unpredicted ways.

In light of the intertwining relationship between districting and representation, this project has ramifications for the current debate on redistricting reform. Current debate centers on the role of electoral competition in redistricting and democratic

representation. Some argue that since choice is an essential element of a functioning democracy (Downs 1957), districting plans should ensure some degree of competitive districts. In fact, both partisan and incumbent gerrymanders are odious occurrences, according to this school of thought, because they both rob the public of the ability to elect candidates of the other party. The system, built on the gerrymander, will not be responsive to the public because political power is relatively insulated from changes in public opinion. The solution is to draw districts in such a way as to maximize the number of competitive seats (Issacharoff and Karlan 2004; Butler and Cain 1992; McDonald 2006, 2007).

An alternative perspective of the representational function of competition has emerged from the work of Thomas Brunell (2008) and Justin Buchler (2005). These authors argue for the opposite districting arrangement: the best system of districts is an extreme incumbent gerrymander. Such a system groups like-minded partisans together and should minimize the number of within-district electoral losers. Citizens in such a districting system would be represented by a legislator of their own party (except, of course, the 10-20 percent of the district population who belong to the minority party) and would supposedly lead to greater congruence between representative opinions and votes and constituent opinions.

The results of this project should give pause to supporters of both of these camps. The findings suggest that both of these plans would have detrimental effects on the linkage between constituents and their elected representatives. Both maximizing and minimizing district competition necessarily involves treating individuals a having only one important attribute: political party attachment. To create competitive districts or non-

competitive ones, mapmakers would need to weaken the territorial nature of districts. District boundaries surely could not regularly be collections of counties or cities; they would also likely not be compact. Likewise, smaller constituency sizes would make designing competitive districts more difficult, not easier, since larger districts are more heterogeneous and their median voters will by and large be more similar to the median voter in the state than would occur if districts were small. Yet this work shows the damaging representational effects of large constituency sizes. By treating districts as simple aggregations of party preferences, both plans put forth a principle of representation which necessarily competes with the idea territorial representation.

This work suggests an alternative to the above districting ideals. Districts could be drawn to embrace, not ignore, the geographical nature of districts by balancing the principles of coterminousness and compactness and coupling them with increasing the size of legislative chambers to decrease constituency sizes of districts. A districting system built on small legislative districts with clear, compact, and coterminous district boundaries would enhance the representational relationship as experienced by constituents.

The analysis presented in this project suggests two concrete improvements to the districting system. First and foremost, the House of Representatives and a number of state legislatures are too small to maintain a close representational relationship between legislators and their constituents. The evidence shows the representational benefits of increasing the number of seats in these legislatures to decrease constituency sizes. American legislatures were designed under the assumption that the chambers would grow

in accordance with population changes; it may be time to reconnect chambers to population.

The U.S. House is in clear need of growth, as has been suggested by a number of scholars (e.g. Frederick 2007, 2009; Lijphart 1998; Yates 1992; J. R. Hibbing and Alford 1990). The evidence presented in Chapter 6 reinforces previous findings with one of the largest surveys and the most extensive battery of questions ever used to analyze the role of constituency size in the House. Chapters 4 and 5 extend the issue to the state level. Population growth in states like California, Florida, Texas, Arizona, and North Carolina will continue to push the issue. If chamber sizes do not change, in 20 years, North Carolina will see constituency size increases of over 25,000 persons per district in the House of Representatives and 60,000 persons per district in the Senate. By 2030, Arizona is expected to face constituency sizes of 180,000 and 360,000 persons per district in the House of Representatives and the Senate, respectively. California, Texas, and Florida are all expected to grow by over 12 million residents between 2000 and 2030: such increases would lead to Senate constituency sizes of 717,000 (Florida), 1,074,800 (Texas), and 1,161,100 (California). Each state senator in California and Texas, then, is expected to represent more constituents than do the entire legislatures of Rhode Island, Montana, North and South Dakota, Vermont, Delaware, or Alaska! The representational consequences are real. Legislators in such states risk losing touch with their constituents by not increasing chamber size in accordance with population growth.

Second, districting plans could balance the districting principles of compactness and coterminousness to create districts which are logically tied to geography, grouping together citizens who live close to each other and in the same locality into the same

district. The two principles are generally reinforcing: coterminous districts tend to be compact, since counties and (usually) cities are relatively compact shapes. The empirical analyses suggests reforms may see a greater return for the efforts by focusing on coterminousness, since that principle was shown to have influence at the state legislative level as well as the congressional district level. Further, creating coterminous districts will *tend* to limit noncompactness as well. Compact and coterminous districts should be marked by increased constituent-legislator communication and a more informed constituency, since the districting principles make it easier for constituents to receive political information and place themselves within the districting system.

Such a districting system, however, will require representational tradeoffs. Increasing the number of legislative seats would certainly influence the workings of legislative chambers. Taagepera's (1972; 1989) theoretical work on legislative chamber size highlights the tradeoff between constituent-legislator communication and legislator-legislator communication. As the number of seats grow, the act of legislating – particularly garnering sufficient support for bill passage and managing coalitions within the legislature – becomes more difficult. A prominent argument for freezing the size of the U.S. House of Representatives, in fact, was that the House had grown too large to effectively deal with the nation's problems (Frederick 2009). In addition, increasing the number of seats in the legislature results in decreased visibility, power, and influence for individual legislators. Smaller constituency sizes may lead to a stronger constituent-legislator linkage but may decrease the ability of legislators to carry out campaign promises and influence policy due to their diminished influence.

Drawing compact and coterminous districts also require tradeoffs with two key districting principles: equal population and majority-minority districts. Chapter 3 detailed how the reapportionment revolution ended the practice of districting by counties. Likewise, a strict population-equality standard (at the federal level almost no population deviation across districts is allowed; at the state legislative district level, approximately 10 percent total population deviation has been deemed acceptable by the courts (Levitt 2008)) makes it difficult, if not impossible, to draw districts with coterminous boundaries. Population equality standards may need to be relaxed, particularly for congressional districts for compact and coterminous districts to be realized.

Another tradeoff exists between these geographical districting principles and majority-minority districts. In areas in which minority residents are not geographically centralized, the only way to create majority-minority districts is to draw noncompact districts with noncoterminous boundaries. A 2004 study of majority-minority congressional districts during the 2002 redistricting cycle found that compactness requirements decreased the number of majority-minority and majority-influence districts, while requirements supporting coterminousness had no effect on majority-minority districts and increased the number of majority-influence districts (Barabas and Jerit 2004). The study clearly shows the tradeoff between geographic districting principles and minority representation: noncompactness may be necessary if the minority population's residential pattern is not itself compact. Of course, the Barabas and Jerit study analyzes districting principles when constituency size is very large: it is more difficult to draw majority minority districts when the constituency size is large, since the minority population must also be large enough to reach the 50% threshold.

7.3 Future Research

This work has provided strong evidence that district characteristic influence representation experienced by citizens. Yet citizens are only one-half of the representational relationship. How do district characteristics change legislators' strategies and behaviors? While the connection between districts and legislative behavior has been assumed here and suggested from previous research, much more can be done to test the connection. How do legislators representing large constituencies campaign and communicate with their constituents? Are certain strategies more effective than others for maintain contact in the face of large districts? Do legislators use geographical districting principles selectively for partisan or incumbent gain, perhaps by redistricting open seats or seats controlled by the minority party into noncompact and/or noncoterminous districts? In short, there is great potential for districting characteristics to influence and be influenced by political elites.

Other areas of future research are policy representation and representation of racial groups. No connection was found between district characteristics and perceived policy responsiveness of U.S. House members, but perhaps the broad left-right political dimension is the wrong place to look for district effects. Perhaps district characteristics show their importance in the influence of local interests on legislative voting behavior. Also, the analyses presented here did not differentiate between racial subgroups. Do constituency size, compactness, and coterminousness influence the way racial groups experience representation equally? Given the role of geographical districting principles play in avoiding the appearance of racial gerrymanders, it is by no means a given that have equal effects across subgroups.

Finally, future studies should examine different measurements of district characteristics, particularly of geographic districting principles. Dozens of alternate measures of compactness have been proposed, and Altman (Altman 1998c) finds that ratings of districts vary by the measure used. In other words, the compactness score given to a district is dependent on the way compactness is measured; a different measurement choice may result in an entirely different assessment of the compactness of that district. While I believe the compactness measure utilized here is the best theoretical measure of the concept of compactness, there are other potential measures. Foremost among them is the population moment of inertia, which calculates the most compact shape given the population distribution of the district around the some central point (centroid, location of incumbent, or historical district core). More analysis is needed to see if the empirical results would differ using different compactness measures.

Similarly, the way coterminousness is measured here differs from measurements used in previous work. My measurement focuses clearly on the ability of citizens to know the location of boundary lines. Perhaps other measures which more precisely capture the amount of county and city splitting between multiple districts will have other effects on the representational relationship. In summary, more attention to measurement issues is needed since the geographical districting principles can be measured validly by more than one measure, and each measure may capture distinct effects of the principles.

7.4 Conclusion

For decades, legislative districts have been drawn as if they matter only for the electoral success of legislative candidates and the partisan and racial groups those candidates represent. The primary contribution of this work is to show that districts

matter beyond defining the dominant partisan or racial attributes of district constituents. Districts influence how representation is experienced by constituents.

By creating a political community, defining its interests by delineating its scale and boundaries, and structuring interaction between constituents and their elected representatives, districts shape the representational relationship. Redistricting plans deserve some of the criticism for the widespread belief that legislators, particularly those in Congress, are out of touch with and unresponsive to constituents. District characteristics like the number of constituents, the shape of the district, and the location of boundary lines relative to other political boundaries, alter the representational experience for constituents with very real consequences for trust in government, evaluations of legislative institutions and representatives, perceptions of responsiveness, and the degree and type of constituent-legislator communication. If a major problem with representative democracy in America today is the increasing distance between the governing and the governed, and if negative evaluations and less constituent-legislator communication and information transmission mark a degenerating representational linkage, then it may be time to make better districts. It may be time to create more legislative districts with smaller constituency sizes as well as compact boundaries which are coterminous with recognizable and meaningful political boundaries in order to secure a healthy and vibrant representational relationship on which American representative government rests.

Table 7.1 Summary of Empirical Results: Congressional District Characteristics

Evaluation/ Behavior	Object or Type	Constituency Size	Compactness	Coterminousness
Approval	Congress	(-)		
	Representative	(-)		
Communication	Contact	(-)	(+)	(+)
	Party Recall	(-)	(+)	(+)
	Race Recall	(-)	(+)	(+)
Responsiveness	Service			(+)
	Policy Allocation	(-)	(+)	(+)

Note: Plus and minus signs denote whether the empirical analyses show positive or negative relationship between the evaluations or behaviors and the district characteristics of statistically significant relationships only. Results from multilevel models in Chapter 6.

Table 7.2 Summary of Empirical Results: State Legislative District Characteristics

Object	Evaluation/ Behavior	Constituency Size	Compactness	Coterminousness
Government	Trust	(-)		
	Fav. Opinions	(-)		
Legislature	Approval	(-)		
	Responsiveness	(-)		
Representative	Responsiveness	(-)		(+)
	Contact Met	(-)		(+)

Note: Plus and minus signs denote whether the empirical analyses show positive or negative relationship between the evaluations or behaviors and the district characteristics of statistically significant relationships only. Results from multilevel models presented in Chapters 4 and 5.

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