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Distortion and Revolution in Texas U.S. Congressional Redistricting Politics: 1972-2014

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Abstract

Over 42 years and 22 US congressional elections between 1972 and 2014, Texas evolved from a state controlled by the Democratic Party since Reconstruction to one dominated by the Republican Party. This thesis examines the relationship between measures of district compactness and changing demographics (decreasing non-Hispanic White percentage and increasing Hispanic percentage) on a measure of electoral bias, as measured by a metric called distortion during this transition. Distortion is the difference between the percentage of seats won by a party with the percentage of votes it received in a statewide congressional election. Using a general linear regression model, the research finds that distortion decreases as compactness increases, while demographic variables do not significantly affect distortion.

Contents

I.   Introduction

All 435 Representatives in the US House are elected every two years. Each state
has a number of representatives proportional to their state population (with a
minimum of one per state). Each congressional representative is elected from a
specific geographic district in the state. These districts within states are reconfigured
following the census conducted at the beginning of each new decade. States gain or
lose representatives based on how their population changes. The political party in
the state controlling the redistricting process designs congressional districts favoring
their party (with some constraints).[1] The collective impact of who is elected to
represent every district in the US is profoundly important. It determines which party
controls the US House of Representatives. The process is anything but mundane.

This thesis tells a story about congressional redistricting in one state – Texas –
during a politically volatile period in its recent history as the state underwent a major
shift in political control, even as it experienced major demographic changes. This
research examines how compactness and demographic shifts had on the distortion
in Texas US House elections. Figure 1 shows the dramatic change. The transition
point in political control that occurred between 2002 and 2004 is a focus of this
thesis.

This study is about congressional redistricting - an extremely spatial activity. The
physical shape of districts is carefully crafted to include some spaces and people
and to exclude others. People responsible for redistricting frequently crowd certain

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[1] Twenty states have different types of committees responsible for developing redistricting plans (La
Raja 2009: 214).

groups of people together (packing) or dispense them between many districts (cracking).

Texas US Congressional Seats Held by Political Parties 1972-2014
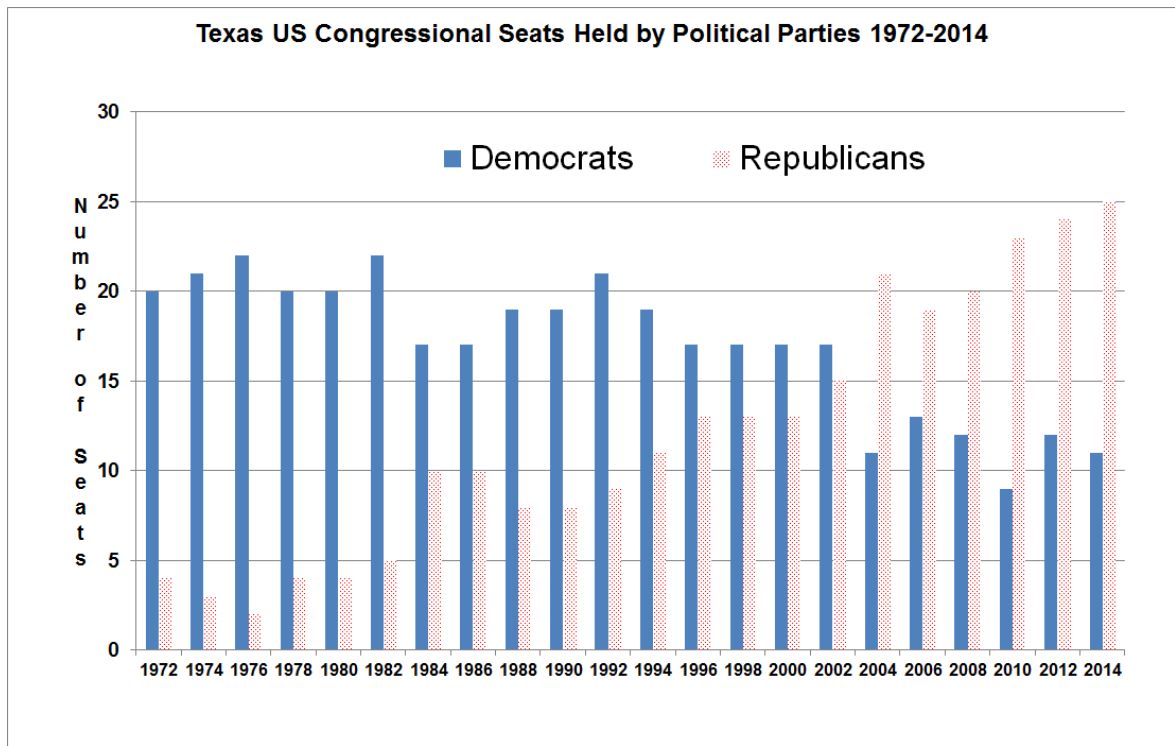
Figure 1. Outcomes of Texas Congressional Elections between 1972 and 2014.

In 1984, the owner of a small pest control company was elected to the US House to represent his Sharpstown community outside Houston, Texas. Nineteen years later (2003) he was elected Majority Leader in the US House of Representatives. He wanted a bigger Republican majority in the US House[2], and following the 2002 elections, convinced the Texas Republican Party to take an unprecedented action – to re-redistrict Texas a second time following a census. Surviving several legal challenges, these moves dramatically reshaped Texas congressional districts and resulted in a momentous change in the balance of power in the Texas Congressional delegation.

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[2] In reality, had Delay not forced the re-redistricting in Texas in 2003, the Republicans would have *lost* control of the US House in the 2004 election (Jacobson 2005: 201).

The man is Tom Delay,[3] and his unprecedented successful re-redistricting of Texas for a second time in one census decade provided the impetus for this thesis. The Texas story told here exemplifies types of redistricting activities undertaken by both major parties that occur around the country – including recent efforts to re-redistrict states following intra-decade state elections.

What makes this Texas case study so important is that it serves as an example of the implementation of the Republican Southern Strategy to gain additional congressional seats in the US House in the latter part of the 20th century (Lewis-Beck et al 2008: 154-156; Kousser 2010: 368-371). More importantly, however, what has happened in Texas since the early 1970s may serve as a *harbinger of future demographic shifts that are occurring in the United States over time.* How the two major parties deal with these changes will dictate which party controls the US House of Representatives in the future.

Since the 2004 US House election, the Republicans have dominated the Texas Congressional delegation. As the non-Hispanic White population percentage in Texas continues to shrink over time and the percentage of Hispanic/Latinos (a census term) grows, both parties will be challenged to capitalize on these demographic shifts.

While many states have gained or lost a small number of seats between 1972 and 2014, what also makes Texas important is that during the last five census

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[3] His victory was pyrrhic. After being indicted for money laundering, he lost the Majority Leader position in 2005, and resigned in disgrace from the House in 2006. His legal troubles stemmed from charges that he manipulated funds related to funding selected candidates in the re-redistricting process. He was tried and convicted of various charges in 2010. In 2013, an appeals court threw out the verdict, and in 2014, another court rejected the effort of the prosecution to reverse the appeal court's decision

redistricting cycles, it has increased its number of representatives by 50% (from 24 in 1972 to 36 in 2012). Following each census, the state has needed to carve out new districts from old districts and adjust the geographic shape of impacted districts. The first election using the new configuration occurs two years after each census. That is, following the 1990 census, elections occurred in the new district shapes in 1992 and continued for an additional four elections until 2000.[4] Then the cycle – census and redistricting – began again.

As noted previously, Texas experienced a number of large demographic changes during the 1972-2014 congressional elections. This paper examines what impact they had on election bias as measured by distortion. Specifically, did declines in the non-Hispanic White population, increases in the urban population, and increases in the Hispanic population significantly influence the Democratic distortion variable and what impact did changes in the compactness of congressional districts have on the variable?

II. Thesis Outline

This thesis begins with a review of relevant literature covering several important aspects of congressional redistricting, including foundational laws, judicial decisions, compactness, partisan bias, and redistricting in Texas. Next, the methodology and data section discusses the statistical approach used and the study variables. The Results and Discussion section explains the findings and their implications for redistricting policy. The paper concludes with comments about the implications of the changes that occurred in Texas during this 42 year period, thoughts about future

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[4] In some cases court decisions rendered after the first post-census election required adjustments to some districts and adjacent districts.

Texas congressional races, and suggestions for additional areas of research evaluating the distortion variable. Finally, the appendix analyzes the lasting impact of redistricting over the five elections following each census and some suggestions for further research.

III. Literature Review: Congressional Redistricting

The literature review in this thesis is unusually broad in an effort to provide readers not familiar with congressional redistricting literature background on how redistricting is viewed in the Political Science community. Few articles have been written on redistricting in Geography journals such as *Political Geography*.

Redistricting of U.S. Congressional districts, as mandated by the U.S. Constitution, is a contentious process - a "bloodsport" - well documented in the academic literature (Aleinikoff and Issacharoff quoted in Manheim 2013: 574).

"Research on redistricting engages an enormously complex set of issues" (La Raja 2009: 203) is a reasonable summary of what researchers face when dealing with and trying to understand the redistricting process and its consequences.

Redistricting is a fundamental political activity associated with Democracies and occurs in the U.S. after the decennial census conducted each new decade year. It is profoundly spatial (Chen and Rodden 2013, Ricca et al 2013). "Redistricting is the spatial redistribution of voters. The simple act of relocating a district boundary alters the representational relationship for numerous voters and this can have considerable electoral consequences." (McKee 2013: 624) These new boundaries also disrupt relationships previously established by representatives in their old districts. The process results in new physical, economic, and social congressional districts.

Post census redistricting is done for many reasons including 1) when increases or decreases in state population necessitate a change in the *number* of representatives, 2) to precisely equalize district size reflecting changes in population, 3) to protect or hurt incumbents by cracking districts into several pieces, 4) to maximize the advantage when a new party is in control of the state legislature and governor's office, or 5) because it is required by the courts (La Raja 2009, Ricca et al 2013, Manheim 2013).

There are numerous potential consequences of redistricting such as changes in polarization[5], increases or decreases in marginal districts[6], and development of descriptive representation in majority-minority districts,[7] where a member of a minority is elected to the US House and, frequently, large numbers of minorities are packed in a district (Chen 2013; La Raja 2009). These are all important, and there has been much written on each of these topics, but they are not the primary focus of this literature review.

The modern redistricting process has changed from an ad hoc process run by local operatives to multi-million dollar operations with lawyers, social scientists, and numerous other consultants (Galderisi and Cain 2013: 6). This layer of influence adds immeasurably to the complexity of redistricting and redistricting research.

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[5] A spatial process of partisan realignment along ideological lines that increasingly polarizes the parties.

[6] The winner receives 60% or less of the popular vote

[7] Creation of these special districts with at least 48 or 49% minority population is designed to ensure representation of minorities in the US House of Representatives. These protected districts were created after passage of the 1965 Voting Rights Act responding to concerns that minorities were being deprived of representation through districting maneuvers.

This examination of the literature looks at several literatures related to political redistricting. It initially describes the qualities of good redistricting based on the constitution, voting rights laws, normative social justice values - in addition to numerous Supreme Court and other court decisions. It briefly reviews important literature related to compactness and then examines the various legislative and non-legislative approaches to redistricting. This section next considers new events that can significantly impact voting practices and redistricting in the coming years. The final part includes a lengthy review of literature involving Texas redistricting.

A.   The Constitution, Important Laws, and the Courts.

The foundational document for U.S. redistricting is the U.S. Constitution. It dictates that state representatives to the U.S. House shall be apportioned following a census taken at the beginning of every decade.[8] The 14th and 15th amendments[9] also directly impact elections. The Voting Rights Act (VRA) of 1965 and 1975 define what can and cannot be done in conducting elections and in structuring district boundaries. Subsequent amendments to the 1975 VRA have expanded protections to other minority groups including Hispanics (La Raja 2009).   The courts play an increasingly important role in interpreting the constitution and the VRA, and they are

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[8] Article 1 Section 2 of the U.S. Constitution mandates an every state census be conducted every ten years. It reads: "Representatives … shall be apportioned among the several States which may be included within this Union, according to their respective Numbers…. The actual Enumeration shall be made within three Years after the first Meeting of the Congress of the United States, and within every subsequent Term of ten Years, in such Manner as they shall by Law direct."

[9] The 14th deals with civil rights ["No state shall make or enforce any law which shall abridge the privileges or immunities of citizens … without due process of law, nor deny to any person within its jurisdiction the equal protection of the laws."] Specifically, "redistricting plans must comply with the equal representation principle; … not discriminate against minorities; … avoid excessive gerrymandering" and other regulations (Manheim 2013). The short 15th amendment states "The right of citizens of the United States to vote shall not be denied or abridged by the Unites States or by any State on account of race, color, or previous condition of servitude. The Congress shall have the power to enforce this article by appropriate legislation." (U.S. Constitution)

frequently heavily involved in the redistricting process itself (Cox 2005, McKee 2013, Manheim 2013, Cottrill 2012, La Raja 2009).

Court intervention in the current era began with the 1962 Supreme Court decision in *Baker v. Carr,* which set in motion subsequent suits contesting the apportionment process in many states (La Raja 2009). The 1962 Court ruled it would consider legislative apportionment questions (Sauter 2012). The plaintiff, Charles Baker, brought suit against the state of Tennessee arguing the rural districts were overrepresented because the state legislature had never reapportioned districts based on equal populations. The Court agreed with the plantiff.

With that case, the federal courts became actively involved in assessing the constitutionality of the districting plans of several states. In those cases the court may dictate the state submit a new acceptable plan. Finding the newly submitted plan unacceptable, the court can impose a districting plan on the state. A second condition imposed by the Supreme Court, in an attempt to ensure the one person – one vote proposition, requires districts have almost identical populations. This constitutional requirement, reinforced by the courts, virtually ensured all districts would be reshaped to some degree following a new census (Cox 2002: 19-20).

While partisanship in the legislature and governor's office has always been important, partisanship in the courts has become important as well. The makeup of the courts can strongly impact approval (or disapproval) of districting plans and the subsequent elections (Cox 2002: 23-26).

Legalities ensuring neutrality and the fair representation of minorities in redistricting are complex. The courts over the recent decades have, for various

reasons, either approved or rejected proposed redistricting plans that create

majority-minority districts and other configurations (La Raja 2009). With the Supreme

Court's interest in developing majority-minority districts to ensure minority

representation, it is ironic that the impact of this emphasis frequently results in the

packing excessive numbers of minority voters into heavily minority districts. Minority

representation is increased, but at the cost of generating more White-dominate

districts (Cameron, Epstein, and O'Halloran 1996: 794).

For all the maneuvering and manipulation of Congressional district boundaries by

political parties and the subsequent legal challenges, "the evidence that partisan

gerrymanders actually have their intended effect is mixed." Redistricting does not

guarantee the anticipated success of its political designers (McKee 2013: 624).

B.   Characteristics of "good" Redistricting

Webster (2013: 4) reminds us there is a normative element to the redistricting

process. It has a central purpose:

> "to provide the population quality representation on boards, commissions,
> councils and in legislatures and Congress. High quality districting plans should
> provide representation to the greatest number of population groups possible, a
> notion that will clearly become of greater importance as the United States
> becomes more demographically diverse with each census."

Synthesis of the 14th and 15th amendments, the Voting Rights acts of 1965 and

1975, and many court decisions have established criteria that help define a good

redistricting plan. Among these are *neutrality* - no political party should take

advantage of these spatial configurations to win seats; *population balance* -

precisely equal numbers of people in each district; *spatial contiguity* – the

requirement that any place in the district can be reached without leaving the district;

and *compactness* - districts should be "'closely and neatly packed together.'" A circular configuration is an idealized perfectly compact district shape (Ricca et al 2013: 226).

The impact of compactness and conformity to existing political boundaries can be subtle. Engstrom (2005: 78), for example, finds voter turnout is not impacted by either district compactness or conformity. Rather, his analysis suggests conformity with media markets impacts voter turnout by affecting the ability of challengers to gain name recognition. His analysis did not directly analyze how district constituents voted but does challenge his own previous work suggesting compactness is important.

"Good" redistricting also depends on one's perspective. La Raja (2009: 211) draws upon the 2002 Cox and Katz work, Elbridge Gerry's *Salamander: the Electoral Consequences of the Reapportionment Revolution,* in which they identify two important themes used in redistricting and election studies. These are partisan bias and responsiveness. Partisan bias is the comparison of party votes garnered in relation to the number of congressional seats won. Responsiveness is the sensitivity of seat changes in relation to changes in vote share. In a responsive environment, a small change in vote share can generate a large change in congressional seats won (or lost). State government control by one party tends to generate partisan bias by packing the supporters of the opposition party into a minimum number of districts. A divided government tends to reduce partisan bias and responsiveness by developing incumbent-protected districts.

C.   Compactness

Until the 1962 *Baker v. Carr* decision, the U.S. Supreme Court did not interfere in the redistricting process. Since then, it and many other courts have been active in passing judgement on proposed redistricting plans. Since 1962, many other criteria have been identified and established as measures against which these plans are evaluated.

There are three primary and several secondary criteria. The primary criteria, established prior to 1962, were equal population, contiguity, and compactness. Subsequent ones include racial equality, preservation of government subdivisions, preservation of communities of interest, preservation of the cores of prior districts, and protection of incumbents (Webster 2013: 3; Ricca et al. 2013).

The compactness criterion is easy to conceptualize but difficult to specify or explain. The term is easily defined as some variation of joined or packed together; closely and firmly united.[10] As of 2009, more than 36 states have statutes that require their congressional districts be compact (Webster 2013: 7). The compactness measure was challenged and became established law in the 1993 *Shaw v. Reno* divided Supreme Court decision (Webster 2013; Pildes and Niemi 1993). "The geography of election districts 'is one area in which appearances do matter.'" (Pildes and Niemi 1993: 484). Appearance matters is as specific as judges have adjudicated.

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[10] Here is another definition: "Compactness is the generalization to topological spaces of the property of closed and bounded subsets of the real line: the Heine-Borel Property. While compact may infer "small" size, this is not true in general."
http://www.msc.uky.edu/droyster/courses/fall99/math4181/classnotes/notes5.pdf (accessed March 25, 2015)

One challenge associated with compactness is the spatial demographic that Democrats tend to cluster more in cities while Republicans disperse more equally throughout a state. That distribution favors Republicans in local and state races (Chen and Rodden 2013; Cox 2006).

Many researchers have developed mathematically based optimization models for designing districts (Ricca et al. 2013; Young 1988). These models are mathematically defined, and researchers identify advantages and disadvantages of each model (Young 1988; Pildes and Niemi 1993; Altman 1998, Pildes and Niemi (1993: 553-557). They identify three general compactness quantitative measures: dispersion (a circle is a perfect shape), perimeter (a district's area compared to a circle based on its perimeter), and population (comparing the population contained within a polygon ["rubber-band" stretched tightly around the district] area with the actual population. They conclude only the first two measures are appropriate for implementing *Shaw* because population measures "do not measure "'shape'" in the usual sense and therefore do not necessarily reflect the problems *Shaw* identifies" (Pildes and Niemi 1993: 558).

There are numerous measures of compactness. The most common, the Schwartzberg Measure (Polsby and Popper 1991: 347-350), was used in this thesis. It compares the actual area of a district with the area created by making a circle using the perimeter of a district. It is calculated as follows:

$$\text{compactness} = (\text{district area} * 4 * \pi) / (\text{district perimeter})^2$$

Figure 2 shows the compactness measures for the Democratic and Republican districts between 1972 and 2014. During the 1970 census elections, the Republican

districts were slightly more compact than the Democratic ones. For the 1980 and 1990 census elections, the opposite was true. Since the Republican takeover in 2004, the Republican districts have been slightly more compact than the Democratic districts. Using a standard Student T-Test, the only election in which the compactness measures for the two parties was statistically different was the 2002 election, the last election dominated by the Democratic Party. The differences in compactness scores between the two parties were not significant in the remaining 21 elections.

The map in Figure 14 shows the 2014 Texas Congressional districts by party. It shows Democratic districts are convoluted (uncompact) districts in the Houston and Dallas-Fort Worth urban areas, El Paso, and elongated districts running from south Texas to Austin. As shown in Figure 2 below, these districts tend to be less compact on average than the Republican districts.
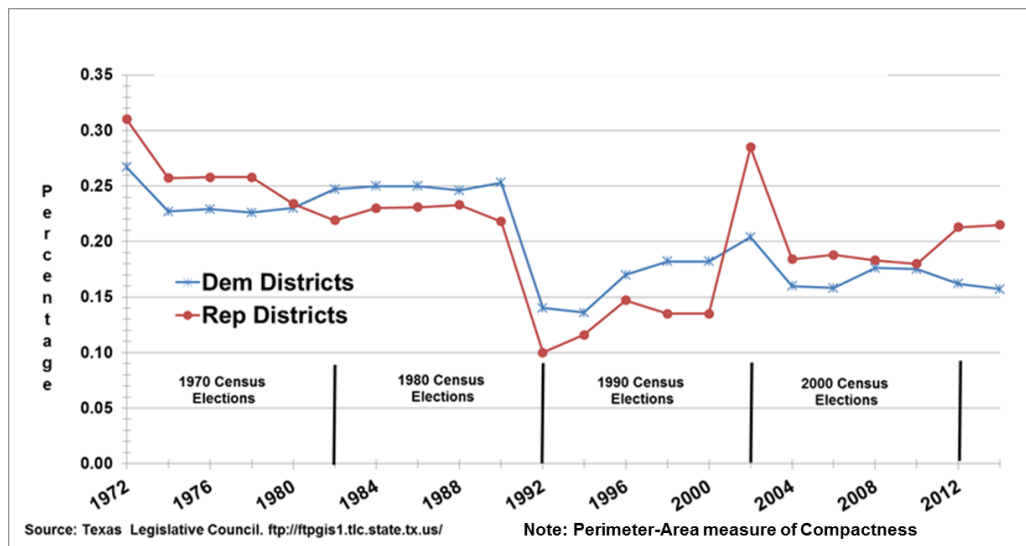
Figure 2. Degree of Compactness by Party by Election 1972-2014.

When many people think of congressional redistricting, their first thought is of gerrymandering – the construction of wildly shaped districts with long fingers

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collecting snippets of population here and there. These districts typically have very small compactness scores.

The maps below show extremes in Texas Congressional elections districts between 1972 and 2014. Figure 3 shows the *least compact* district created in a Texas Congressional race during this period. It was created by the Democratic Party and was Democratic District 29 in Houston in 1992. It has a compactness score of 0.007. Figure 4 shows Republican congressional district 26. It includes Denton and is north of Fort Worth. It is the most compact district in 2014 with a compactness value of 0.46.
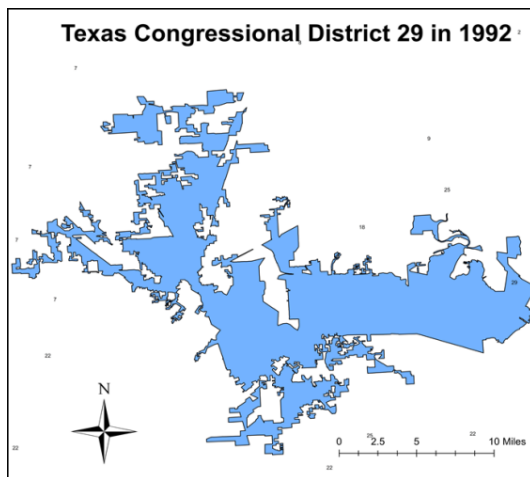
Figure 3. Least Compact Texas District.   Figure 4. Most Compact Texas District.
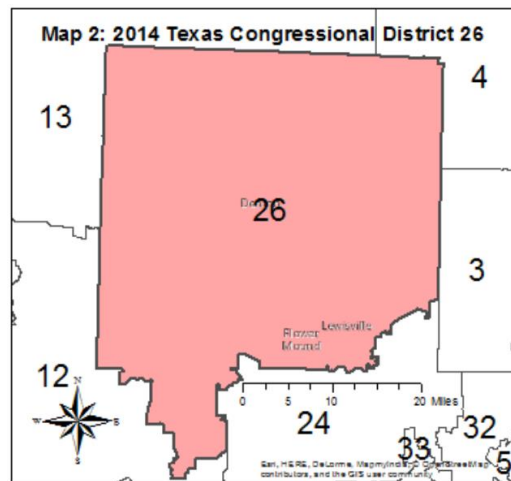
D.   Partisan and Non-partisan Redistricting Approaches

State legislatures in all the states have responsibility for redistricting. In order to create more competitive races, twelve of the states, however, have given some portion of that responsibility to commissions with non-legislative approaches (Cottrill 2012). Those outside groups in the states have various compositions and independence. These approaches can be "partisan, bipartisan, and judicial." (Masket et al 2012: 40).

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State redistricting authorities cannot always agree upon a plan. In those situations redistricting does not occur after a census. If a state loses representation and no new plan is approved, technically all representatives are elected at-large. However, if the representatives remains the same or increases and no agreement can be reached by the legislature and governor on reapportionment, then the existing districting can be adopted and if there are additional representatives, there is an at-large election. This default approach is called a *reversionary plan* and is rarely used (Cox 2005: 18-19).

La Raja (2009: 214) classifies districting plans as Madisonian or Progressive in nature. The Madisonian approach assumes self-interest permeates all parts of politics, and redistricting plans must be developed to limit this self-interest to achieve broader social goals. The Progressive approach, a legacy of late 20th century politics, seeks "rules based on widely accepted norms and expert administration" to guide new district creation. It prefers commission-type approaches to redistricting.

The normal spatial distribution of Democrats and Republicans in states can also create what Chen and Rodden (2013: 239) describe as "Unintentional Gerrymandering:"

> [H]uman geography plays a far greater role in generating electoral bias in the United States than commonly thought. Building on existing literature, we explore the argument that Democrats are often more clustered in space than Republicans as a result of the industrial revolution, great migration, and subsequent patterns of suburbanization (241).

Republicans are frequently more evenly dispersed in states, including living in outlying areas in small, rural communities and in suburbs or exurbs. Democrats tend to live in more homogeneous neighborhoods than Republicans (Chen and Rodden

(2013: 245). Democratic margins in urban districts, some of which are majority-minority districts, may be considered squandered to an extent because the Democratic candidates are elected by wide margins – with votes that could swing elections in adjacent districts. This subject is discussed further in the section on partisan bias.

Similarly, Myers (2013: 56, 59), using a very small spatial unit of analysis, the Voter Tabulation District (VTD), examines changes in polarization (between progressive and conservative ideologies) in state-wide Texas elections between 1996 and 2010 and concludes the primary changes result from increased partisanship in low populated areas in East and Central Texas favoring Republicans and increased partisanship favoring Democrats in large urban areas. These changes in voter attitudes more than overcame the influx of Hispanics during these years and helped create the Republican revolution in Texas.

E.   Impact of Redistricting

By its very nature, it is evident redistricting can create uncertainly for incumbents (McKee 2013; Fenno 1978). Simply stated, new constituents in a reconfigured district may not be familiar with the new incumbent candidate, and the new constituents are unknown to the candidate (Desposato and Petrocik 2005: 35) A long history of community service and good-will generated by the incumbent may have no meaning or value to his or her new constituents.

A bigger question, however, is do the efforts by commissions, the courts, and others create more competitive elections? The research is inconclusive (La Raja 2009: 215). Some argue the "[i]mpact of partisan redistricting on partisan

redistricting and polarization are small, considerably more nuanced than reformers would suggest, and overwhelmed by other aspects of the political environment." (Masket et al 2012, La Raja 2009). This environment includes events playing out on the national scene, quality of the candidates at the top of the ticket, importance of the election, and the consequent mood of the national electorate (Desposato and Petrocik 2005: 35). Ongoing research by Carson et al, however, suggests congressional districts designed by commissions and courts are more competitive than those drawn by legislatures (Carson 2014: 166).

Incumbent representatives and the state political parties have different priorities in redistricting. The objective of the first is to maximize his or her victory margin to ensure re-election. The priority of the second is to maximize party controlled seats in the state. Frequently, a compromise is agreed upon by the majority party and its incumbents to accomplish both goals. Incumbents accept a reasonable victory margin, and the party has votes to distribute elsewhere to achieve its goals (La Raja 2009; Desposato and Petrocik 2005).

F.   2013 and future redistricting trends.

Section 4 of the 1965 VRA requires certain states and other jurisdictions[11] submit proposed redistricting plans and other voting law changes to the US Justice Department prior to their implementation. They must get preapproval or preclearance. This requirement was inserted because of a historic pattern of voter discrimination and suppression in these states and municipalities.

In 2013, a 5-4 landmark decision by the US Supreme Court in *Shelby County, Alabama v. Holder, Attorney General* overturned this key component in the VRA as unconstitutional because it used 40-year-old data. Challenges to voting rules must now be brought *subsequent* to their implementation (Liptak 2013).

Shortly after this decision, Texas introduced restrictive new voter regulations that made voting more difficult. It sparked national attention when a female judge said she was turned away at her polling location of many years because of different middle names used in her identification documents (Boothroyd 2013).

The long term effects of lifting this half-century requirement to force greater electoral equality will play out in upcoming elections this decade and following the 2020 census. Given the partisan nature of the current US legislature, it is unlikely Section 4 of the 1965 VRA will become revived by congress. The option to pass a new law was a somewhat cynical recommendation of the Supreme Court majority who recognized that would not occur in the near future.

Another significant long trend will be the strong temptation for political parties who take control of their state legislatures and governorships in mid-decade to

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[11] Nine states are impacted: Alabama, Alaska, Arizona, Georgia, Louisiana, Mississippi, South Carolina, Texas and Virginia. Other jurisdictions include numerous counties and political locations such as Brooklyn, Manhattan and the Bronx (Liptak 2013).

continue the mid-decade practice inspired by Texas after 2002, as a "mechanism that party elites increasingly resort to in an effort to secure political advantage." (McKee: 2006: 317).

G.   Partisan Bias

Partisan bias is analysis that examines the relationship between the percentage of votes received by a party in an election and percentage of seats the party wins. In an ideal world the two percentages would be the same. In reality, parties in our non-parliamentarian, winner-take-all system attempt to maximize their percentage of seats gained with a minimum percentage of votes. Commonly, the victorious party receives less than 65% of the common votes, although the percentage seats won may be much higher (Tufte 1973: 540).

The partias bias calculation uses linear regression with % seats won as the dependent variable and % votes gained as the independent variable (Tufte 1973: 542). This relationship is shown as % Seats = α + β(% Votes) where α is the constant and β is the slope of the equation or swing ratio (also called responsiveness). The percentage of Seats increases by the swing ratio for each 1% increase in percentage of votes garnered in the elections. The percentage of votes required to win 50% of the seats is calculated, and the difference between that number and 50% is the partisan bias or party advantage. For example, if 45% of the votes is required to win 50% of the votes, the partisan bias is 50%- 45% = 5%.

Figure 5 shows the results of this analysis using the Texas congressional electoral results examined in this study.
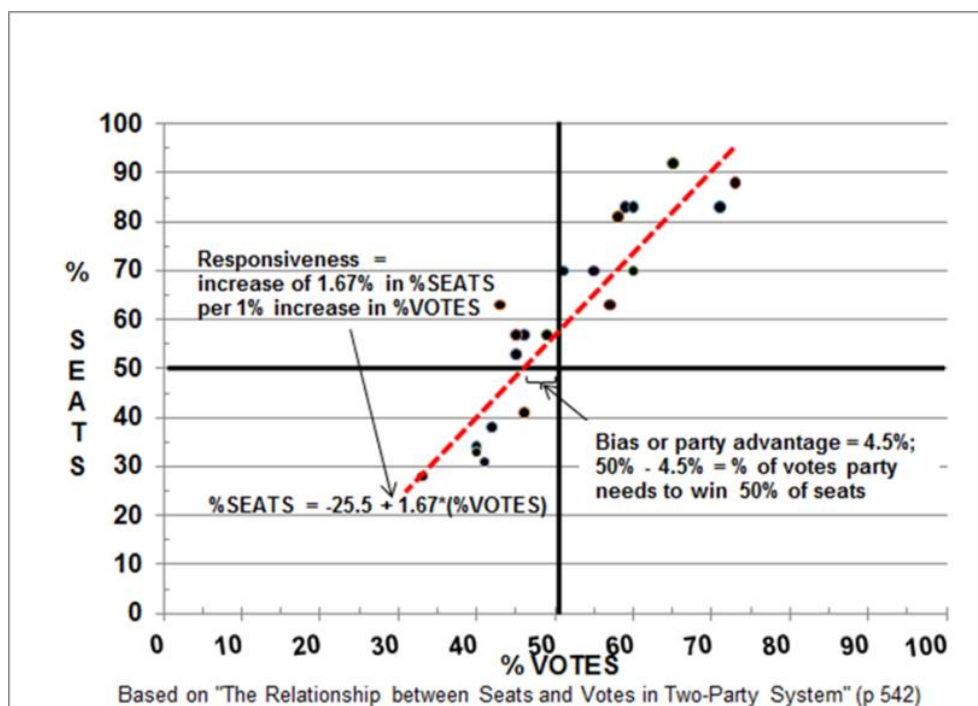
Figure 5. Regression Graph showing % Seats vs. % Votes in Texas US House races 1972-2014.

The responsiveness shows that for every 1% increase in Democratic %VOTES share, the %SEATS share increases by 1.67%. The party advantage or bias is about 4.5%. This means the Democrats would need to receive about 45 to 46 percent of the votes to gain 50% of the congressional district seats. Partisan Bias research typically compares elections in many locations over many years.

While this analysis (Figure 5) is consistent with earlier research in partisan bias (Tufte 1973), this thesis analyzes %SEATS and %VOTES in a different way. Partisan Bias is a single number and is calculated using a series of elections (as shown in Figure 5). In this paper, the relation between %SEATS and %VOTES is calculated for each election, for example all the districts in the 1972 or in the 1974 elections.

Figure 5 also shows the susceptibility of the classic Partisan Bias metric to the time period one chooses to analyze. Figure 5 suggests the Democratic Party has had an advantage in Texas during the years covered in the research, which has not been the situation since 2004.

H.   Texas Redistricting

The literature of Texas redistricting following the 2000 and 2010 censuses describes two major threads: first, how the Republicans dramatically increased their representation in the Texas US House caucus following their historic second redistricting after gaining control of the Texas legislature and governorship in the 2002 elections and, second, the factors that help them maintain this dominance. While several researchers have written on these events, there is a significant gap in understanding them from a geographical perspective (Myers 2013; Bickerstaff 2007; Cox 2004; Katz 2006).

This literature describes the transition in Texas that had previously occurred in the Southeastern states as part of the successful Republican strategy to wrest those states from traditional Democratic dominance. This shift, carefully examined using many theoretical prisms, occurred between the 1960s and the 1990s as the result of significant economic and social shifts in the old south (Myers 2013: 48). Myers (2013: 49) quotes Shafer and Johnston's finding that "by the late 1990s 'a new Southern political order' had emerged."

This tumultuous period (1950s to 1990s) was a time of political awakening and empowerment for southern African-Americans (Hutchings and Valentino 2004: 387). Decisions made in Washington dramatically disrupted the traditional southern

economic, racial, and social system. It was also a great awakening for southern

Whites of all economic and social classes and religions. The political pendulum

swung in one direction for the Democrats and in another for the Republicans.

Socially conservative, religious White southern Dixiecrats of varying means became

Republicans and currently serve as the bulwark of the dominant conservative branch

of the contemporary Republican Party (Shafer and Johnston 2006; Kousser 2010;

Toobin 2003). At the same time southern black Democrats elected black

representatives to the U.S. House in record numbers as a result of many majority-

minority districts, but their creation actually has helped promote a greater

Republican majority in these states (Cameron 1996; Toobin 2003).

The Texas redistricting literature describes the many court findings that nudged

the process and hindered or enabled some specific plans. It describes the political

processes involved in gerrymandering congressional districts to the advantage of the

majority party - and how that party can protect its dominance even following future

decadal censuses during which the traditionally Democratic Hispanic population is

expect to continue to increase (see Bickerstaff 2007; Katz 2006; McKee et al 2006).

As Bickerstaff (2006: 1) put it: "The redrawing of congressional district lines in

Texas in 2003 was one of the most extraordinary political events in the past fifty

years, the culmination of a three-year effort to increase the Republican majority in

the United States House of Representatives. The significance of the outcome lay not

only in its effect on the relative strength of political parties in Texas or in the U.S.

Congress, but also in the precedent it set for political and redistricting trends

nationwide."

Key to this story is the remarkable growth in Texas population in the past several decades. The state gained three congressional seats following the 1990 census, an additional two seats after the 2000 census, and four more seats following the 2010 census for its current thirty-six US House seats. This dramatic growth has fueled substantial redistricting and provided opportunity for political intrigue and gamesmanship (Sauter 2012; Texas election website; McKee et al 2006).

1. Gaming the system: the Republican takeover

As with many states, the redistricting process in Texas has been contentious for many election cycles. Democrats dominated Texas politics for decades and had controlled the Texas House since Reconstruction (Bickerstaff 2006: 15). Republicans were accustomed to challenging their redistricting plans – and losing in the courts (Bickerstaff 2006: 315). By the 1980s, however, political fortunes in Texas were changing. The Republicans were steadily gaining strength in US congressional elections. On the state level, "[n]o Democrat has won a statewide election in Texas since 1994" (Bickerstaff 2006: 20)

Tom Delay, the ambitious majority leader in the Republican dominated US House, was the pivotal figure in this 2000-2004 period. His explicit goal - "I'm the majority leader and we want more seats"– was to gain control of both Texas Houses and increase the number of Republican US House members (numerous sources including Bickerstaff 2006; McKee et al 2006).

Following a successful state election cycle in 2002, Delay had the perfect storm: Republicans controlled both houses in the Texas Legislature, the governorship, and had a Texas Republican in the White House with control of the US Department of

Justice. He could now re-redistrict Texas for a controversial second time within the same decade to accomplish his goal. The US Constitution specifies only that the process be completed following a decennial census. It does not specify that it can be done only once (See Cox 2006 for a full discussion of this issue.).

As is common in early stages of the redistricting process, Texas Republicans developed five different redistricting plans, all of which were vigorously contested in court by the Democrats and organizations such as League of United Latin American Citizens (LULAC) (Katz 2006: 38). The final redistricting plan was developed by a small group of Delay's associates (a "political cabal") and dramatically altered many Texas districts (Bickerstaff 2006: 236).

The Supreme Court in *LULAC v. Perry* in 2006 upheld much of the proposed redistricting but raised an important point that continues to fester in congressional redistricting. The court ruled unconstitutional the redistricting of a south Texas district that had placed a hundred thousand Hispanics in a new district. It also ruled constitutional dismantling a Fort Worth district in which a minority African American population had ensured reelection of an incumbent (Katz 2006: 38).

2.   Re-redistricting prior to the 2004 elections

Understanding what occurred in the 2003 re-redistricting process is critical to understanding the Republican revolution that turned Texas from a purple state into a strongly red state. Texas Democrats recognized their fortunes were fading after the 1990 census. Their redistricting plan in that period was drawn artfully to ensure their majority status in the US congressional delegation during the 1990s. The plan ultimately was struck down in *Bush v. Vera* (1996) in which the Supreme Court

rejected the proposed Democratic plan because it was too closely based on racial factors *(*Sauter 2012: 272).

Following the 2000 elections, Republicans held a slim majority in the Texas Senate, and Democrats had a slim majority in the House. With a split legislature, the parties could not agree on a redistricting plan, and a U.S. District Court imposed a plan changing little while protecting incumbents of both parties. The three-judge court ruled conservatively and maintained much of the 1990 districting as the court-ordered map. In the 2002 congressional elections Democrats maintained a 17 to 15 majority in US House seats, although the Republicans had a 59% to 40% vote majority in statewide congressional elections (Sauter 2012: 273).

Tom Delay's efforts were hugely successful in changing this imbalance between votes and electoral seats in the 2004 US Congressional races in Texas. Republican representation grew from 15 in 2002 to 21 seats in 2004, while the Democrats shrank from 17 to 11 seats – a swing of 12 seats.

Redistricting is generally an evolutionary process where boundaries are tweaked and old districts are modified based on criteria, established regulations, and, frequently, by the courts (See Webster 2013 for a review of current redistricting criteria.). The new boundaries drawn for the 2004 Texas Congressional elections, however, were a dramatic departure from those approved by the court for the 2002 elections with the results noted above. Minorities were packed into ten of thirty-two districts, while Republican voters were spread evenly (64-68%) throughout the remaining districts. Almost 10 million people were moved into new districts (Bickerstaff 2006: 272, 254).

High drama surrounded this second redistricting. The Democrats state legislators twice fled the state in fall 2003 – once to Oklahoma and once to New Mexico – to deprive the Republicans of a quorum for approving the plan (Cox 2004: 752). Republican governor Rick Perry ultimately called two special sessions, and when finally there was a quorum, the dominant Republicans voted to approve the controversial plan (Forest 2004: 447). He signed it into law on October 13, 2003. The final piece was in place when the US Department of Justice approved the plan. The Democrats promptly challenged the proposed plan in a federal district court (*Session v. Perry*). In a 2-1 decision, the court approved the plan with the Texas State Attorney arguing "the legislature had a right in its discretion to choose how best to recognize the voting strength of minority populations within Texas and had no obligation to maximize such voting strength." (Bickerstaff 2006: 260).

The Republican majority gained three seats in the US House following the 2004 elections. Only seven House incumbents running for office across the country were defeated in that election. Four of those incumbents were from Texas (Jacobson 2005: 199). Republican US House gains from Texas were six seats. Delay had achieved his goal of increasing the Republican majority in the US House of Representatives by re-redistricting his home state.

3.   Packing, Cracking, and Fracking.

As noted above, Delay was aggressive in his approach to re-redistricting the state prior to the 2004 US House elections. Packing your opponents into one district is a common tactic to remove them from adjacent districts and make those districts safe for your party. The opposition party wins the packed districts by high tallies, but

any votes above 50% plus 1 are effectively lost. Bickerstaff (2006: 272), for example, lists 10 congressional districts in which the minority population (Hispanics and African Americans) averaged 74.6% of the district voting age population.

Cracking, on the other hand, moves a limited number of opposition party voters into a district strongly controlled by the majority party. The dominant party wins the district with a smaller majority, but the opposition party isn't in a position to influence adjacent districts election outcomes.

The unique term is fracking. I use the term to describe Delay's unusual tactic of attacking incumbents in <u>both</u> parties. Typically, there is an informal understanding that incumbents in both parties are protected during redistricting (Webster 2013:3). That practice was not Delay's intent in 2003.

Steve Bickerstaff's book (2006) describes Delay's tactics for creating a Republican majority in the Texas US House delegation in 2004. After strongly funding the successful Republican take-over of the Texas House in the 2002 general election, Republicans now controlled both Texas congressional bodies and the governorship. There were no Democrats in position to oppose him. Delay's approach involved selecting the "right" Republicans and targeting Anglo Democratic congressmen (they were all male). Texans for a Republican Majority (TRMPAC) was the major vehicle Delay used for fund raising – with the support of several other major commercial trade groups. In addition, the "right" Republicans were required to support Tom Craddick, a Midland, Texas legislator, for Speaker of the Texas House (Bickerstaff 2006: 51). "TRMPAC played a significant role in determining who would be the Republican candidate for the general election by endorsing specific

candidates, contributing money to them during the Republican primary, and orchestrating intense direct- mail campaigns when needed" (Bickerstaff 2006: 51).

With the "right" Republicans in the race, Delay turned to defeating Democratic incumbents. The 10 Democratic incumbents fell generally into 2 groups: 6 were incumbents in strongly Republican districts and 4 Democrats represented Republican-minority districts.

Delay's tacticians developed different tactics for each group. Adding additional Republicans in Republican dominant districts was not feasible. Hence, the shape of these districts was changed to force the Democratic incumbents to run in Republican-majority districts that included significantly new geographies. Republicans in these areas were not familiar with the Democratic representatives – and felt little loyalty to them. Some of the Democrats were in rural districts. Their core constituents were divided among several congressional districts. Of the six Democrats in Republican dominated districts, two were defeated, one did not run for reelection, one changed party (to Republican), and two were reelected - a gain of four Republican seats (Bickerstaff 2006:102-103).

Republicans had other plans for the 4 Democratic Anglo incumbents in Republican-minority districts. One district was a protected (by the Voting Rights Act) majority-minority district. The Republicans selected and tried – unsuccessfully – to elect a Hispanic Republican from this district. Two of the districts were cracked and packed. Large numbers of Black and Hispanic voters were either moved into dominate Republican districts (cracked) or packed into heavily minority districts. The fourth Anglo incumbent was moved from a strongly Democratic Anglo district into a

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320 mile long district stretching from Austin to Hidalgo County in south Texas. It became designated a majority-minority district. Two of the four Democrats were defeated; two won reelection in reconfigured districts. A gain of two Republican seats (Bickerstaff 2006: 104-105).

Another Republican goal was to strengthen the position of suburban Republicans who were more committed to the party than Republicans in rural areas. Blending rural and suburban Republicans into a single district would ensure increased power for the suburbanites. A side effect of this strategy was the decreased compactness of these districts. "[V]ery few districts ended up being compact. Compactness was sacrificed to achieve certain interparty and intraparty goals." (Bickerstaff 2006: 106).

Delay's re-redistricting tactics are a text-book example of redistricting for the maximum advantage of the dominant party.

4.   2010 Census

Ten years later, the 2010 census confirmed Texas had continued to grow rapidly. Its population increased over 20 percent to 25.1 million people, and was now the second most populous state behind only California. Hispanics were 37 percent of the state population and represented 65 percent of the state population growth after the 2000 census (Sauter 2012: 253).

Republican electoral success in top Texas elections continued as a the result of more than just redistricting machinations. Myers (2013: 48) describes this process as "secular geographical polarization." It occurred over time (secular); and is "'geographical' because it is most clearly demarcated across space, and it amounts

to 'polarization' because different geographies are increasingly headed in opposite directions."

"Republicans have made dramatic gains in rural and exurban parts of Texas, many of which had only become marginally republican by the mid-1990s. At the same time, while the most urban parts of the state were staunchly Democratic in the mid-1990s, they have only become more so since then" (Myers 2013: 50).

Stephanopoulos (2012: 1904) identifies the trend of "spatial diversity," which he defines as change in a specific variable across geographic space. As communities became more similar to each other, there was little diversity within the specific communities but significant diversity between them. Rural communities were similar to other rural communities; exurban communities were similar to each other; as were urban communities. The social, economic, and political diversity, however, between the types of communities was significant. In his analysis, Myers (2013: 53) found many of the lightly populated districts in eastern and east central Texas were Republican hot areas of support. In those areas, many of the traditional Democrats had switched parties.

5.   2012 Districts

This dramatic population growth provided the state an additional four seats in the US House and raised its total to 36. This growth ensured another round of Republican dominated redistricting plans, since its dominance in state government continued. With the significant increase in the Hispanic population, many groups anticipated that most of the new seats would become majority-minority districts with Hispanic representatives. In fact, only one of the four seats was configured as a

Hispanic majority-minority district. In spite of broad Hispanic population growth across the South, Texas was only one of two states (Florida the other) to develop a new Hispanic majority-minority congressional district (Peralta and Larkin 2011: 552). The complaint registered by the Hispanic interest groups mentioned earlier was that the proposed new district plans diluted minority groups voting strength, which is a violation of Section 2 of the VRA (Sauter 2012: 275).

This story "… *of Texas redistricting litigation illustrates two outstanding questions in voting-rights jurisprudence: First, how should the mandates of the VRA be reconciled with the question of who "counts" in congressional representation? And second, just how much minority representation constitutes effective representation under § 2? The court's current practice of analyzing VRA compliance on a case-by-case basis will become untenable in the long run. Redistricting law needs a manageable standard by which to determine whether states are effectively representing minorities in congressional redistricting plans" (*Sauter 2012: 257).

Many of the same techniques (cracking and packing) used by White Democrats in the late 1900s to disenfranchise black minorities are now being employed by Texas Republicans to protect their new electoral strength following the 2000 census and future censuses (McKee and Shaw 2005: 277). With traditional patterns of Democratic Hispanic voters continuing to move into and live in urban areas, the Republicans are well positioned to continue their dominance in Texas state and national government and politics following future censuses (Bickerstaff 2006; McKee and Shaw 2005; and Myers 2013).

IV. Methodology and Data

A. Methodology

To assess the impact that district compactness and major demographic changes between 1972 and 2014 had on the outcome of Texas congressional elections, general linear model (GLM) regression was used to assess the relationship between distortion (the dependent variable) and the independent variables: district compactness, the demographic variables, and a dummy variable identifying the party controlling redistricting. Univariate GLM was used because there was only one dependent variable and one of the independent variables was a categorical dummy variable, which made simple linear regression inappropriate.

The general equation for the model was:

$$\text{Dependent Variable} = \alpha + \beta(\text{Var}_1) + \mu(\text{Var}_2) + \nu(\text{Var}_3) + \rho(\text{Var4}) + \sigma(\text{Var5}) + \varepsilon_i$$

where α is the intercept value, β, μ, ν, ρ, and σ are coefficients for each independent variable, and ε_i is the error term.

The expectation of this analysis was that the compactness variable would be significant and could be considered a proxy that reflected the strategies used by both parties during their years of controlling the redistricting process. The large demographics changes in Texas during the study period would also be expected to significantly shape the election results.

B.   Data

The data for this thesis was derived from the accumulation of election results for each congressional district race in each election cycle[12]. Thus, for the 1970 census elections (1972 – 1980), the raw data included the results of each of the 24 district races. For the 2014 election, the data was derived from each of the 36 congressional district races. Between 1972 and 2014 there were 637 congressional district races in Texas. Given the nature of the dependent variable, distortion, the results for the individual districts races were combined into collective results for each of the election cycles. There were 22 congressional elections between 1972 and 2014, and each represents one of the 22 cases in the model. Thus, the sample size (n) is 22. All elections were won by a Democrat or Republican.

1.   Dependent Variable - distortion

The dependent variable is distortion. It uses the same factors as Partisan Bias (party advantage), except it is calculated for each congressional election cycle (see previous partisan bias discussion). For each of the 22 election cycles distortion is the aggregate difference between the percentage of seats won by the Democratic Party and the percentage of votes the Democratic Party received. Mathematically, it shown as: Distortion = 100*(%SEATS - %VOTES). Cumulative distortion is zero, and the distortion values of each party are complementary. Thus, if distortion for the Democratic Party in one election cycle is +6, it is -6 for the Republican Party. The %SEATS number is straight-forward. The %VOTES calculation, however, includes only the combined votes received by the Republican and Democratic parties in each

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[12] Cycles refer to each election year. The congressional district elections in 1972, for example, represent one cycle.

district race. If other parties received 4% of the vote, for example, the total vote for the two major parties is 96%. The %VOTES for the Democratic Party is the percentage of votes it received of the combined Democratic and Republican party total. Thus, if the Democratic Party received 65% of the votes in a district race and the Republican Party received 31%, the %VOTES = 0.65/(0.65 + 0.31) = 68%. %VOTES is combined from each district race to calculate an average %VOTES in for election cycle. Election results were taken from The *Almanac of American Politics* published each two years. Official U.S. House election results with candidates, parties, and vote tallies are also available in Election Results at http://history.house.gov/Institution/Election-Statistics/Election-Statistics/ (accessed January 3, 2015). Texas US House election details for 2014 were found at http://www.usatoday.com/pages/interactives/elections-results-2014/#house-tx (accessed January 3, 2015).

Figure 6 shows the combined Democratic and Republican percentage votes and percentage seats during the 1972–2014 periods. Visually, several trends are clear: The percentage of seats won by the Democrats clearly declines during the study period (as those of the Republicans increase). The same trend is true for the percentage of votes won by the Democrats and Republicans.
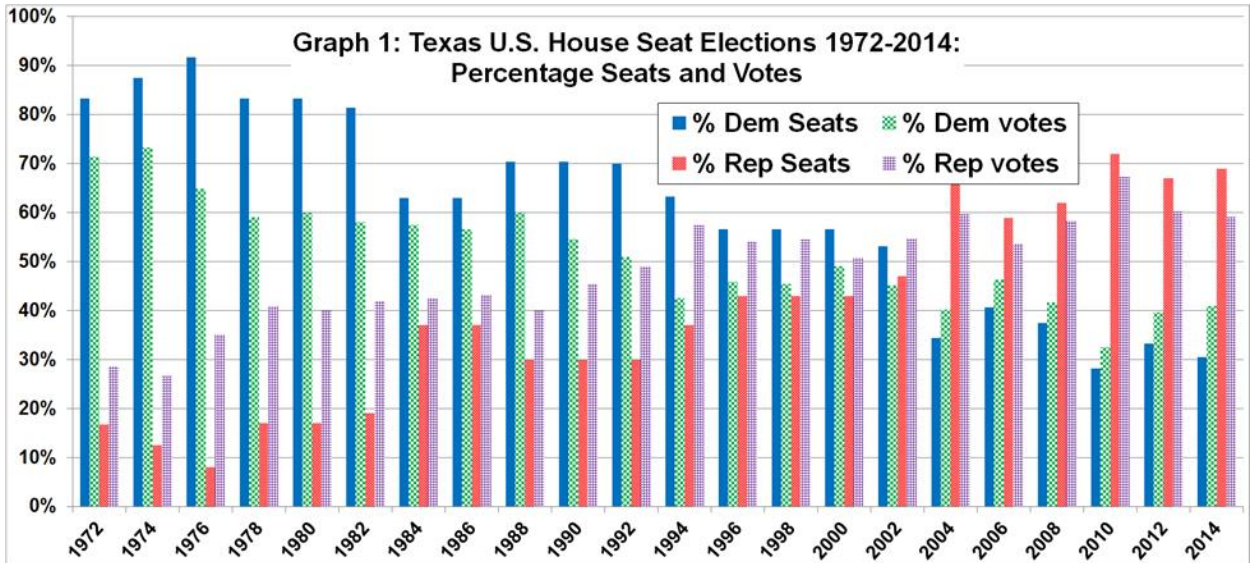
Figure 6. Texas US House Seat Elections 1972-2014: Percentage Seats and Votes.

Figure 7 summarizes the distortion results based on the difference between the

Democratic and Republican % Seats and % Votes seen in Figure 6.
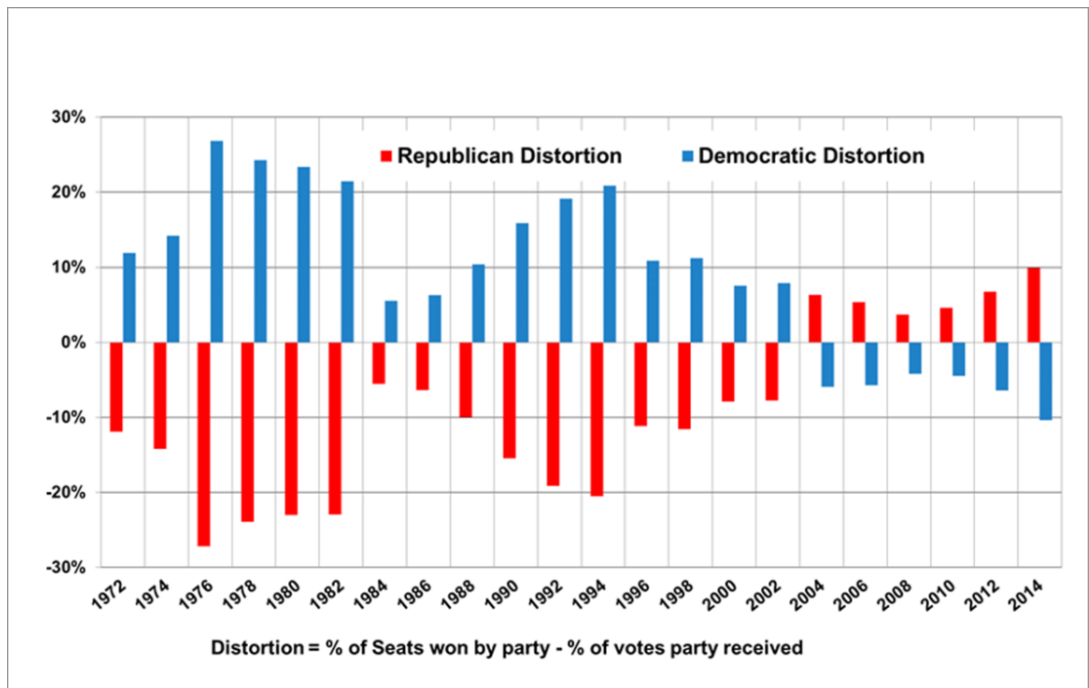
Figure 7. Distortion in Texas US House Elections between 1972 and 2014.

Figure 7 shows that during the periods (1972-2002) the Democratic Party had positive distortion values. Once the Republicans took control after re-redistricting in 2003, they have gained positive distortion scores. The decline in the positive distortion scores for the Democrats beginning in the late 1990s foreshadowed the power shift that occurred early in the next decade.

Another examination of Figure 7 shows the relative performance of the elections that showed responsiveness and partisan bias. The average Democratic distortion in the elections it controlled redistricting was +15%. In the six elections controlled by the Republicans, Democratic average distortion was -6%.

Figure 8 is Figure 5 (the Partisan Bias chart) that highlights declining fortunes of the Texas Democratic Party congressional election results between 1972 and 2014.

Figure 8. Democratic % Seats vs. % Votes in Texas US House Races 1972-2014.

2. Independent Variables

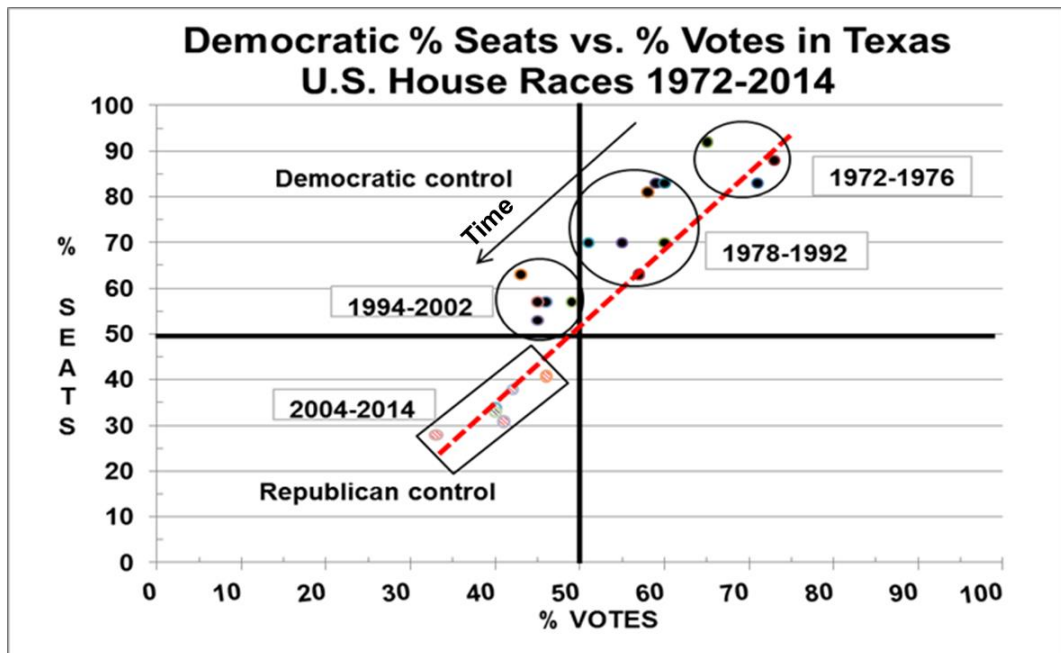There are five independent variables in the model. The first independent variable is the average district compactness[13] of each election cycle. There are three demographic variables - percent urban population (verses rural), percent non-Hispanic Whites, and percent Hispanics. These represent dominant demographic changes in the state during the study period as measured in each election cycle. The fifth variable is a dummy variable indicating whether the Democratic Party or the Republican Party effectively controlled the redistricting process. Figure 9 shows the changes for each variable.

Variable	Type	Min	Max	Standard Deviation	Source
Compact-ness (average)	Continuous Range: (0-1)	0.1	0.274	0.0417	Calculated. Area and perimeter data at ftp://ftpgis1.tlc.state.tx.us/temp/
% Urban	Continuous Range: (0-100)	72.8	84.8	3.8	*Almanac.* Taken from Census Bureau data.
% Non-Hispanic White	Continuous Range: (0-100)	44	87	15.6	*Almanac.* Taken from Census Bureau data. Only non-Hispanic Whites.
% Hispanic	Continuous Range: (0-100)	15.4	38.8	7.9	*Almanac.* Taken from Census Bureau data.
Dominant Party	Categorical Range: (0-1)	0	1		Party controlling redistricting 0 = Republican Party 1 = Democratic Party

Figure 9. Independent Variable Properties.

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[13] Again, the Schwartzberg Measure, which divides district area by a circle based on the district perimeter, was used in this thesis. Both area and perimeter values are included in the Texas Legislative Council files at ftp://ftpgis1.tlc.state.tx.us/temp/.

Compactness

Compactness measures reflect the strategy of the dominant party in charge of redistricting. The Schwartzberg compactness measurement was used. See the compactness literature review for a fuller description of this variable.

The literature review on compactness describes why measuring compactness is important. First, redistricting includes and excludes certain populations. That is, districts comprise both physical boundaries and population distributions. Districts with low compactness values are often carved out to create majority-minority districts (resulting in the election of Black or Hispanic US House representatives). While these districts may be federally protected, they tend to aggregate opposition voters together into a single district. Compactness can measure how opposition voters are more generally packed together or separated (cracked) into spaces controlled by the dominant party. Second, compactness is a proxy for how districts are shaped to create safe districts for the dominant party and marginal districts (winner receives 60% or less of the total votes) for the opposition. Compactness values reflect the strategy of the party controlling the redistricting process.

As highlighted previously in the discussion preceding Figure 2, a Student T-Test run on Republican and Democratic compactness values in each of the 22 elections between 1972 and 2014 showed no significant differences in the compactness scores between the two parties, except for one election. In the 2002 election, the average compactness for the 17 Democratic districts was 20.4% and for the 15 Republican districts 28.5%, significant at $p = 0.05$.

Demographic Variables

Figure 10 shows the change over time in the three Texas demographic variables.
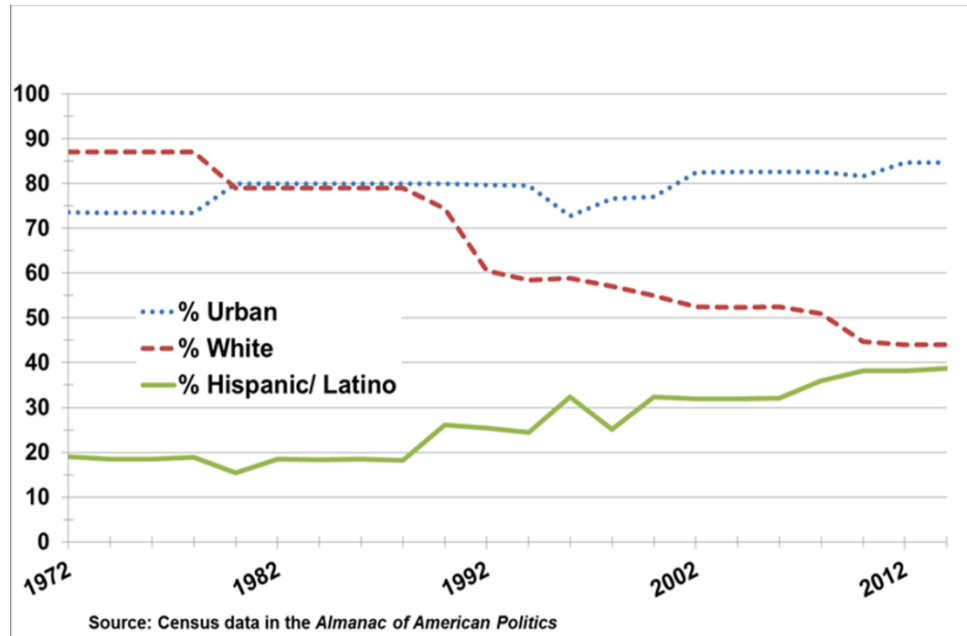
Figure 10. Selected Texas District Demographics 1072-2014.

Two demographics shown in Figure 10 are particularly important. First, the percentage of non-Hispanic Whites has declined to less than 50 percent of the total population since the 1990s. With the addition of Blacks and other minorities, Texas is now a White-minority in total population. The white population segment has not grown nearly as fast as the Hispanic/Latino segment.

Hispanics

The Hispanic/Latino population has grown to almost 40 percent of the total population. The Hispanic/Latino growth, however, is somewhat deceptive. The percentages represent census numbers, which counts everybody including undocumented Hispanics who are ineligible to vote in elections plus underage individuals. Over the years, the percentage of Hispanics eligible to vote is

approximately 1-3% fewer than their numbers, and provides non-Hispanic eligible

voters (primarily non-Hispanic Whites) an equally positive bump in their Voting Age

Population (VAP) numbers in relative terms.[14] In 1980, there were 3 million Texas

Hispanics and 0.6 million Hispanic voters. In 2012, the Hispanic population

increased to 10 million with 1.9 million voters, an almost equal percentage. Almost

sixty-nine percent of the Texas Hispanic population is considered part of the VAP,

while seventy-three percent of the non-Hispanic population is considered in the VAP

(Stanley 2010 conference presentation).

As Campoy and Tamman describe in their *Wall Street Journal* article (2011),

Hispanics represented 65% of the population growth in the 2010 census. Hispanics,

based on this growth, expected to gain 3 of the 4 new congressional seats awarded

Texas following that census. In reality, they gained one Hispanic majority-minority

seat. And, as reported by Kevin Diaz in the *Houston Chronicle* (2014), the fight for

Hispanic votes in Texas is becoming more competitive. Hispanics still primarily vote

for Democrats, but in diminishing percentages. Harold Stanley in his 2010

conference paper reported in the 2008 presidential election Hispanics split their vote

70% for Democrats and 30% for Republicans while Blacks voted 90% for

Democrats; and Non-Hispanics voted 70% Republican (Stanley 2010: 10).

Urban Population

The census now, as noted previously, includes the suburbs as urban in its

urban/rural split. The Texas population is becoming increasingly urban as those

living in rural environments represent as decreasing demographic. With the

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[14] See district election results, for example, at
ftp://ftpgis1.tlc.state.tx.us/temp/2012G_H309_pop_and_election/

Republican tactic of removing the suburban space from the central city core described previously, this urban space, as defined by the census, is no longer primarily a Democratic domain.

<div align="center">**Non-Hispanic Whites**</div>

While the percentage of non-Hispanic Whites declined over the decades, the character of the remaining Whites also changed. The traditional Democratic base of small farmers were displaced and replaced by suburbanites moving into Texas who responded to the Republican message of lower taxes, smaller government, and strong family values (Micklethwait and Wooldridge 2004: 32).

The 2010 Census confirms Texas is now a White-minority state. Non-Hispanic Whites, as noted in the 2012 *Almanac of American Politics* (1518), represent 45.3% of the Texas population; Blacks[15] 11.5%; and non-White Hispanics 37.6%. Figure 10 above shows the declining percentages of non-Hispanic Whites over the recent decades.

V. Results and Discussion

Results of the General Linear Regression Model show the Dominant Party variable and Compactness variable were significant, while the large demographic changes occurring during the 1972 – 2014 period were not.

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[15] %Blacks is not included as a variable in the model. While the absolute number of Blacks in Texas has increased, their relative percentage of the total Texas population has declined slightly from 12.5% in 1970 to 11.6% in 1990 and 11.5% in 2010 as the percentage of other populations increased more rapidly. They are a vital voting bloc for the Democratic Party, but their relative numbers have not significantly changed since the 1970s.

The R^2 for the model is high at 0.808 with an adjusted R^2 of 0.748, indicating the model explains a large proportion of the variance in the dependent (distortion) variable. The full results of the General Linear Model are shown in Figure 11.

Dependent Variable: Democratic Distortion

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	-30.202	87.509	-.345	.734	-215.713	155.308
[DominantParty=Rep]	-14.648	5.212	-2.811	.013	-25.696	-3.599
[DominantParty=Dem]	0[a]	.	.	.	.	.
AveCmptns	-111.629	61.015	-1.830	.086	-240.975	17.716
Urban	.332	.718	.462	.650	-1.191	1.854
White	.549	.448	1.226	.238	-.400	1.498
HispanicLatino	.148	.698	.212	.835	-1.332	1.628

Notes: 1) [a]This parameter is set to zero because it is redundant.   2) R Squared = .808 (Adjusted R Squared = .748)

Figure 11. General Linear Model Results.

Two variables are significant in the model. The categorical dummy variable, Dominant Party (Republican or Democratic) is significant at the $p = 0.05$ level. This finding is not surprising since the dominant party creates the districts during redistricting. Even as the Democratic party in the 1980s and 1990s were losing voter support (as the Republican Party was growing stronger), the Democratic Party was still able to dominate the Texas US House delegation. Appendix A examines how successful the parties are in their efforts to craft Texas congressional districts to their advantage during the 5 elections following each new census.

The second significant variable is average compactness ($p = 0.1$). The coefficient is negative, indicating the dependent variable (Democratic distortion) is *inversely* correlated with compactness. As compactness increases, Democratic distortion values decrease. That is, the difference between %SEATS and %VOTES decreases. As compactness increases, the elections become less efficient in the

sense that the difference between %SEATS and %VOTES becomes smaller and more votes are required to generate the percentage of seat won. The Partisan Bias score (the percentage of votes required to gain 50% of the congressional seats) for the Democrats is smaller (a large Partisan Bias is desirable); more votes are required to win 50% of the seats in the elections. The Partisan Bias results for this data are shown in Figure 5.

Since 2004, the Republican Party has dominated redistricting. The model findings indicate that increasing compactness reduces bias (Democratic distortion) and suggests compactness matters not just in terms of appearance, but also in electoral results. This analysis can be revisited in coming years to confirm the Republican trend.

None of the demographic variables (%Urban population, %non-Hispanic Whites, and %Hispanic/Latino) are significant. Even with the apparent decline in some of the Republican base (the non-Hispanic White population) and the large increase in the Hispanic population, either of these demographic variables was significant.

Solutions to the model are shown below. Eq 1 is the general solution. Eq2 and 2a are the solutions when the Dominant Party variable = Republican (1). Eq 3 and 3a are solutions when the Dominant Party variable = Democratic (0). In equations 2a and 3a the numeric values have been combined.

Eq 1 $\text{DemDistortion} = \alpha + \beta(\text{DominantParty}) + \mu(\text{AveCmptns}) + \nu(\text{Urban}) + \rho(\text{White}) + \sigma(\text{HispanicLatino}) + \varepsilon_i$

Eq 2 $\text{DemDistortion} (1 = \text{Rep}) = -30.202 + -14.648(1) -111.629 (\text{AveCmptns}) + .332 (\text{Urban}) + .549 (\text{White}) + .148 (\text{HispanicLatino}) + \varepsilon_i =$

Eq 2a $\text{DemDistortion} (1 = \text{Rep}) = -44.850 -111.629 (\text{AveCmptns}) + .332 (\text{Urban}) + .549 (\text{White}) + .148 (\text{HispanicLatino}) + \varepsilon_i$

Eq 3 $\text{DemDistortion} (0 = \text{Dem}) = -30.202 + -14.648(0) - 111.629 (\text{AveCmptns}) + .332 (\text{Urban}) + .549 (\text{White}) + .148 (\text{HispanicLatino}) + \varepsilon_i =$

Eq 3a DemDistortion (1 = Rep)= -30.202 - 111.629 (AveCmptns) + .332 (Urban) +
.549 (White) + .148 (HispanicLatino) + ε_i

Since none of the %Urban, %White, and %Hispanic/Latino demographic

variables are significant, the regression lines for the model can be shown in Figure

12 with Democratic distortion as the dependent variable and average compactness

as the independent variable.
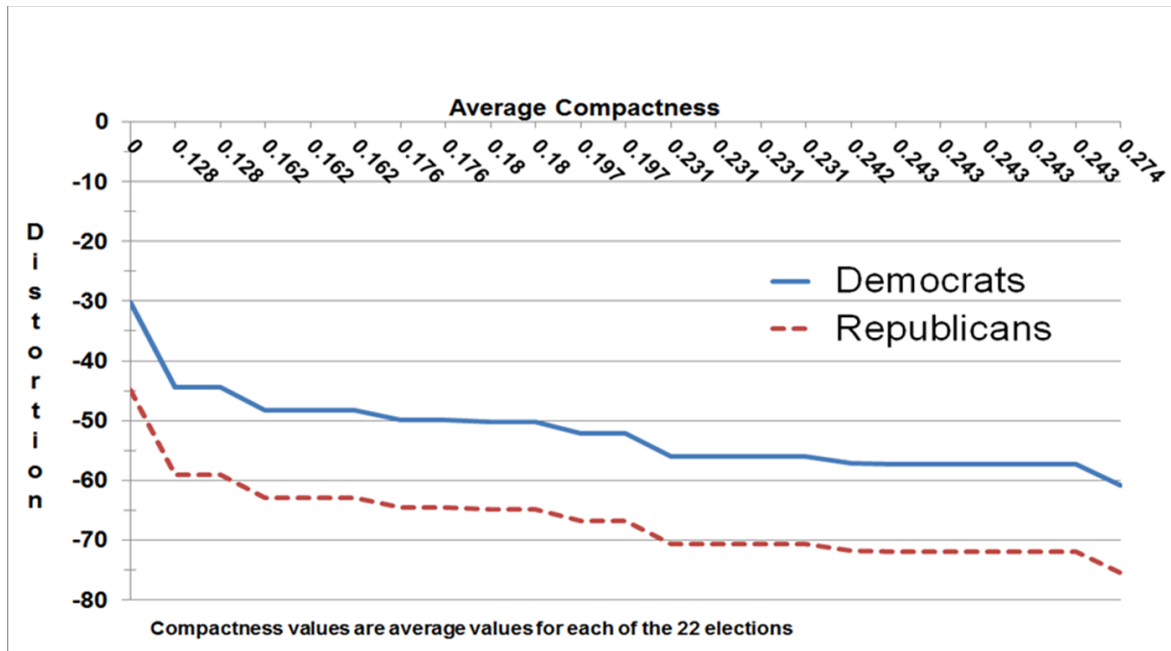
Figure 12. Graphic Display of Distortion vs. Average Compactness in General Linear
Model Results.

The inverse relationship with Democratic Distortion and Average compactness is

visible. As average compactness increases, Democratic distortion decreases – the

differential between %SEATS and %VOTES decreases.

Absolute Distortion

Using absolute values for distortion provides another useful approach to examine

the data. This inspection is important because it answers the question of whether or

not the results of the original model are dependent or independent of the Dominant

Party dummy variable. The model results are shown in Figure 13. It shows several

important findings. First, the R^2 and adjusted R^2 values suggest this model explains much less of the variance in the dependent variable. Second, the previously significant variables, Dominant Party and Average Compactness, are not significant. Third, the three demographic variables remain insignificant. These results strengthen the argument that the variance in the Distortion variable is party dependent. The model using absolute distortion values is not useful for understanding distortion variance but does answer an important question.

Tests of Between-Subjects Effects

Dependent Variable: Absolute Distortion

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	536.249[a]	5	107.250	2.976	.044
Intercept	8.792	1	8.792	.244	.628
DominantParty	16.341	1	16.341	.453	.510
AveCmptns	94.497	1	94.497	2.622	.125
Urban	13.453	1	13.453	.373	.550
White	50.492	1	50.492	1.401	.254
HispanicLatino	3.540	1	3.540	.098	.758
Error	576.666	16	36.042		
Total	4583.261	22			
Corrected Total	1112.915	21			

a. R Squared = .482 (Adjusted R Squared = .320)

Figure 13: Model Using Absolute Distortion Values as the dependent variable

VI. Conclusions

This thesis introduces a variable called distortion that examines the same factors (%SEATS and %VOTES) studied in the earlier Partisan Bias research. Rather than regressing percentage seats won against percentage votes garnered, the variable is a simple subtraction of percentage votes from percentage seats. While it is

mathematically possible for a party to have a positive distortion score while winning less than 50% of the electoral votes, that did not occur in any of the 22 elections analyzed in Texas between 1972 and 2014. Further research is warranted in an examination of how often and under what circumstances that situation occurs.

The model showed two independent variables were significant in explaining the variance in the distortion dependent variable: the dummy dominant party variable and the compactness variable. Finding the dominant party variable significant suggests the party that controlled redistricting was able to create a positive distortion score that, in this study, resulted in winning more than 50% of the Texas Congressional seats in the election cycles they controlled. Between 1972 and 2002, that occurred for the Democrats even as the Republicans were gaining voting strength and the Democrats losing strength.

The second significant variable was average compactness. The policy implications of the finding of an inverse correlation between Democratic distortion and average compactness and a positive correlation of Republican correlation and average compactness can be important for the party in control of redistricting. If the Republican Party maintains control of the Texas Legislature and governor's office in the 2020 election, the findings suggest, based on only six election cycles, that it would do better creating more compact districts given electoral constraints.[16] Future results will confirm this hypothesis.

The full implications of the significance of the compactness variable are somewhat murky and are yet to be fully understood. The findings suggest the

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[16] These include maintenance of majority-minority districts for both predominately Black areas and for predominately Hispanic areas in South Texas.

Republicans in the 6 election cycles they had dominated since 2003 have configured Texas congressional districts to their advantage using increased compactness to create greater positive distortion in their favor.

A partial answer may be provided by Bill Bishop in his *Big Sort* analysis. He compares the 1976 and 2004 Presidential election results by county and finds like-minded people are increasingly congregating together. He writes "In 1976, less than a quarter of Americans lived in places where the presidential election was a landslide [one presidential candidate wins by a margin of $\geq$20%]. By 2004, nearly half of all voters lived in landslide counties" (Bishop 2008: 6). Republican leaders in Texas, intentionally or not, can accomplish their political goals by creating more compact districts packing together like-minded peoples – either Democrats or Republicans.[17]

This finding of increasing compactness in districts created by the dominant party (in this case the Republicans as they gained a majority of the Texas US congressional delegation in 2004) suggests the need for additional research to determine if this Texas trend is also present in other states in the recent redistricting cycles. If the trend identified by Bishop in his book has continued – the self-sorting of like-minded people into their own spaces, it is very possible congressional districts, as a whole, will become more compact. The controlling party may, in fact, increasingly keep various political sub-divisions together (discussed in section III C) as they shape (packing and cracking) electoral districts to their advantage.

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[17] These more compact districts may not include black or Hispanic majority districts, which may remain highly convoluted to create the majority-minority districts required by the VRA and the courts.

The non-significance of the demographic variables is also an important finding. Even as the state population has grown, the non-Hispanic White percentage has declined, and the Hispanic population percentage has increased; these variables have not been shown to significantly impact distortion. Other demographic factors not captured in the gross demographics used in this study are in play and may support the Republican Party gains beginning the 1990s (see, for example, footnote 18).

The Republican Party is currently (2015) in a very strong electoral position in the state – controlling both houses of the Texas legislature, the governor's office, and all the seats on the state Supreme Court. This situation will likely ensure continued dominance during the remainder of the current 2010 census elections through 2020. And, unless the Democrats can win one of the state houses in the 2020 election, the Republican Party will control redistricting following the 2020 census. While the demographic trends are seemly against the Republicans, it is likely the Republicans will continue to allocate (with federal prompting) a number of majority-minority districts to the Democratic Party and redistrict the remaining congressional seats to Republican advantage.

Support of the Hispanic populations will be a critical factor for both parties. As noted earlier, the Democrats enjoy about 70% support from this ethnic group. If the Republicans can increase their support among Hispanics, however, Republican domination of state politics will continue indefinitely. A conservative[18] White-Hispanic coalition in Texas could help ensure Republican domination for decades. Figure 14

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[18] In 2010, about 6.5 million Texans out of a total population of 25 million were Evangelical Protestants (http://texasalmanac.com/topics/religion accessed April 24, 2015), many whom tend to be conservative voters (Micklethwait and Wooldridge 2004).

below shows, the Democratic districts are concentrated either in largely-black areas in the major metropolitan areas or in largely Hispanic areas in south Texas and El Paso. In south Texas and the urban areas, the districts have low compactness scores. The south Texas districts are very long and run up into the Austin area – running hundreds of miles in length.
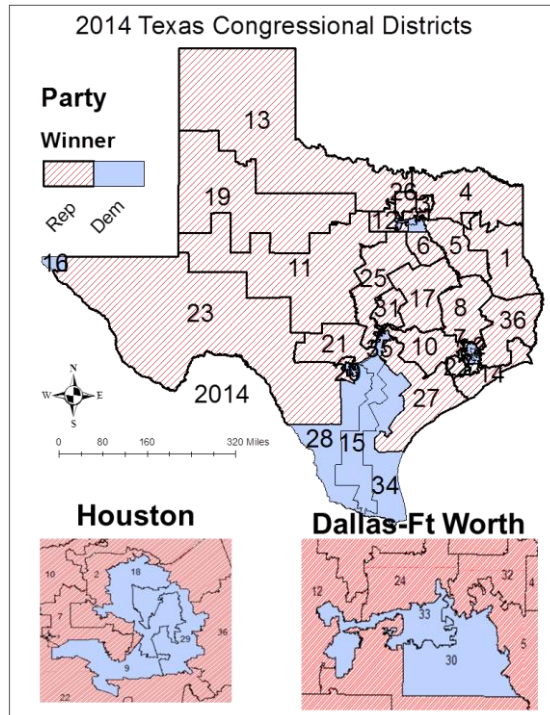

Figure 14: Democratic and Republican Congressional Districts in 2014

This finding is shown in the compactness numbers in Figure 7. The Republican Party redistricting results in more compact Republican districts and less compact Democratic districts. This makes sense from a Republican perspective, as many of the Democratic districts are majority-minority districts where fingers of minority populations are joined in very non-compact districts similar to that shown in Figure 3. These majority-minority districts also allow the Republican Party to increase partisan bias (party advantage) for their districts, while still providing their incumbent and new candidates a safe margin of victory.

The final topic in this thesis is the question of how generalizable is this methodology? Is the distortion variable a useful method for analyzing congressional districts, state legislative districts, and local elections? Is the direct correlation between positive distortion and the dominant party's redistricting since 2000 unique to this study, or is it common in elections across the country? In this study the party with the largest number of congressional representatives always had a positive distortion value. How often will an opposition party have a positive distortion – a higher percentage of seats than percentage of votes? How likely, for example, will an opposition party gain 35% of the seats with 30% of the votes in our winner-take-all electoral system?

If Partisan Bias (discussed in section III G) is, in a sense, the second derivative of %SEATS and %VOTES analysis, then, the distortion variable (%SEATS - %VOTES) can be considered the first derivative. Researchers find Partisan Bias a useful measure of redistricting, and one can then speculate that the distortion variable is also equally useful. Several studies could be conducted to confirm the validity of the distortion variable including states where: 1) states one party controls the state legislative bodies and the governor's office, 2) a second political party controls one legislative body or governor's office (mixed control), and 3) committees are used to develop redistricting boundaries.

At first glance the distortion variable does appear to be a useful tool for analyzing the ability the dominant state or local political party to redistrict its space for its political advantage. Appendix A provides another analysis of how well the party in

charge of redistricting maintains control of the districts it wins in the first election

following a new census for the 5 elections following that census.

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VIII. APPENDIX A: MEASURING THE EFFECTIVENESS OF REDISTRICTING PLANS

Well-constructed redistricting plans in Texas should create safe districts for the party controlling both legislative houses and the governor's office for five elections using the redistricting plan created following a new census. The plan should also constrain the opposition party to a minimum of districts, which are vulnerable to takeover by the dominant party, for example, if an opposition incumbent retires. Using the database developed for this thesis, this idea can be examined.

For this analysis, the party that wins the first election in a new census period in a district "owns" the district for the five elections. Theoretically, it should win the district for the remaining four elections. Figure 15 shows the results for the census periods between 1972 and 2014.

In the 5 elections beginning in 1972 following the 1970 census, for example, the Democrats won 20 seats in that 1972 election. For this analysis they "owned" 20 seats and are measured on their ability to maintain control of those 20 seats. In that period the Democrats won all (100%) of the elections in 17 of the 20 districts (85%). They lost one or more elections in 3 districts (15%). The comparable Republican results are also shown.

The results for 2002 are not included because it was only one election.

Census(total seats)	Democrats						Republicans				
	# Districts	100%	Percent	<100%	Percent		# Districts	100%	Percent	<100%	Percent
1970(24)	20	17	85	3	15		4	2	50	2	50
1980(27)	22	17	77	5	23		5	5	100	0	0
1990(30)	21	16	76	5	24		9	8	89	1	11
2000(32)*	12	9	75	3	25		20	19	95	1	5
2010(36)**	12	10	83	2	17		24	24	100	0	0
* Includes only 4 elections following 2003 re-redistricting. 2002 election not included											
** Includes only 2 elections following 2010 census (2012 and 2014)											

Figure 15. Ability of Parties to Maintain their Seats in the Census Decades between 1970 and 2010.

This simple analysis shows the Democrats had increasing difficulty maintaining 100% control of their seats in the 1980s and 1990s as the percentage of seats they maintained for the 5 elections in those decades declined from 85% to 77% to 76%. This simple finding is consistent with the increasing influence of the Republicans in those decades. In the 6 elections following the 2003 re-redistricting, the Republicans have maintained control of 43 of the 44 seats (98%) they've "owned".

While this analysis may be interesting, comparable results from other states with which to compare it were not available. The study of the effectiveness of the dominant party following a new census to redistrict their state to their lasting advantage is an interesting topic for further research.