STATE POLICY DIFFUSION AND RACE TO THE TOP:
THE IMPACT OF FEDERAL COMPETITIVE GRANTS
ON STATE POLICYMAKING

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The U.S. Department of Education's Race to the Top program marked the first use of a competitive grant program by the federal government to influence state-level education policy. Using a directed state-dyad dependent variable and a piecewise linear growth model to capture states' policy differences and changes, this dissertation investigates the impact of Race to the Top on state-level education policy diffusion in teacher policy, college and career readiness policy, and persistently lowest achieving schools policy during the first two rounds of the competition, spanning March 2009 to August 2010.

The analysis suggests that states were most reactive to federal preferences in the teacher policy area; after the release of federal program guidance and the announcement of Round 1 winners, state policies converged and moved towards the policies of the Round 1 winners, adopting policies to tie teacher evaluations to students' academic growth, compensate based on performance, and incentivize teaching in high-need schools, among others. The effects of federal preferences were not as distinct in college and career readiness policy, in which state policies were generally converging during this time frame, or in persistently lowest achieving schools policy where other grant programs may have mediated the influence of RTTT. Nonetheless, this

study provides evidence to suggest future use of competitive grant programs as a means for the federal government to influence state education policy.

This study adds to education policy research through the use of diffusion theory to understand the effects of federal competitive grants, rather than another policy tool, on state policy reforms. Further, this research contributes to policy and diffusion literature by demonstrating the value of piecewise linear growth models to simultaneously model the spread of policies across states and the influence of federal preferences on state policy decisions over time.

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1 INTRODUCTION

In February 2009, the US Congress passed the American Reinvestment and Recovery Act (ARRA), an estimated $840 billion economic stimulus package intended to temper the effects of the U.S. economic recession. Though the legislation is known primarily for its emphasis on job creation through funds for "shovel-ready" construction and infrastructure projects, the bill provided significant financial assistance to schools, districts, and state education departments. In addition, ARRA designated $4.35 billion in discretionary funds for a new U.S. Department of Education's competitive grant program, Race to the Top (RTTT). As proposed, $4 billion of this discretionary pool[1] was intended to encourage states to develop reform plans to address state, district and school capacity in four reform areas, also known as the four assurance areas:

> Adopting standards and assessments that prepare students to succeed in college and the workplace to compete in the global economy; Building data systems that measure student growth and success, and inform teachers and principals about how they can improve instruction; Recruiting, developing, rewarding, and retaining effective teachers and principals, especially where they are needed most; Turning around our lowest-achieving schools (American Recovery and Reinvestment Act, 2009).

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[1] $350 million was allocated to a grant program for multistate consortia to support the development of academic assessments.

The final RTTT program guidance was not released until November 2009, but within weeks of ARRA's passage *Education Week* published an article about the competitive grant programs in ARRA, noting that "the $5 billion pot of federal money put at the disposal of U.S. Secretary of Education Arne Duncan to help state and local projects under the $787 billion economic-stimulus package is drawing attention far out of proportion to its size" (Klein, 2009). Soon afterward, the states began preparing their applications and making policy changes in the four assurance areas, the Bill and Melinda Gates Foundation was preparing grants to support state education agencies' RTTT grant writing, and education policy pundits were naming early favorites[2] (McNeil, 2009).

This dissertation investigates state policy changes from March 2009 through the end of RTTT Round 2 in August 2010, focusing on policy changes in two of the four assurance areas (recruiting, developing, rewarding, and retaining effective teachers and principals, turning around lowest-achieving schools) and college and career readiness, an implied focus of the U.S. Department of Education. Using a diffusion theory framework, I examine where states looked for policy ideas—to other states or to the federal government—during the first two rounds of RTTT awards. The first chapter will briefly describe RTTT and the state and federal education policy context for the RTTT program, as well as prior attempts to influence public education in states, districts, and schools. Further, I will introduce states' policy changes during the first two phases of the RTTT program, and set forth the theoretical framework for and parameters of this dissertation and the implications of the findings of my analyses.

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[2] Of the four "early favorites," Colorado, Florida, Massachusetts and Louisiana, none were chosen for first round grants and only Florida and Massachusetts eventually received grants.

1.1 ELEMENTARY AND SECONDARY EDUCATION ACT AND FEDERAL INFLUENCE ON STATE EDUCATION AGENCIES, DISTRICTS, AND SCHOOLS

Since its initial passage in 1965, the Elementary and Secondary Education Act (ESEA) has been a significant vehicle through which the federal government has attempted to influence and guide state education policy. In the multiple reauthorizations of the legislation, the intent of the law's Title I provisions and funding mechanisms has morphed from an initial focus on resource redistribution and equalization toward an emphasis on student academic performance and accountability. As described by Manna (2011, 2006) and others (c.f. McGuinn, 2006), the 2001 reauthorization of ESEA, No Child Left Behind (NCLB), reinforced the performance and accountability focus of the law's 1994 reauthorization, adding consequences for schools and districts not meeting progress goals. NCLB focused on the achievement of students and the performance of a school's students over time, emphasizing accountability over redistribution, and requiring states to develop standards and assessments to assess student performance.

NCLB was, on its face, simply the reauthorization of a 36-year-old law, but it marked an unprecedented attempt by the federal government to influence the content, quality, and accountability of education at the state and local levels. Though the amount of Title I funds to states is small, approximately $8.78 billion in the federal government's 2001 budget[3] (U.S. Department of Education, n.d.), the threat of losing even a small amount of funding pushed states to make policy changes to implement accountability requirements. The federal requirements in NCLB guidance did not specify the rigor of state standards or the quality of corresponding state

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[3] To put this in perspective, the U.S. Census bureau reports 2001 spending for public elementary and secondary education was $410.6 billion (Dixon, 2012). Title I funding comprised 0.02% of total expenditures.

assessments; as such, states adopted standards and assessments that varied widely on these characteristics.

RTTT program guidelines and the form of the program itself, a competitive grant, represented the Obama administration's attempt to improve NCLB's less effective accountability measures. As Manna (2011) argues, NLCB's over-specification of consequences and under-specification of uniform state goals created a perverse incentive for states to create low standards which could be easily met by schools. Congress, the President, and the Secretary of Education conceived of RTTT as a competition under which state plans would be judged on the basis of the rigor and quality of their existing and proposed policies and standards. In designing RTTT as a competitive grant, the USDOE made a distinct choice to break from the formula grant mechanism used to distribute federal Title I and similar program funds, such as those associated with Special Education (McGuinn, 2012). Scholars and policy makers suggest that multiple federal formula grant funding streams have lead to fragmentation in state education agencies; they describe a lack of coordination within departments of education that limits the capacities of the agencies to assist schools and districts (Brown, Hess, Lautzenheiser, and Owen, 2011; Unger, Lane, Cutler, Lee, Whitney, Arruda, and Silva, 2008). The intent of RTTT was for states to develop comprehensive, coordinated plans to avoid this sort of "silo-fication." Rather than designating a process for improving systems and schools without specifying the goals for school and system improvement, as was the case for NCLB, in RTTT the USDOE appears to have intended to set the goal for states, leaving them to develop their own plans for reaching those goals.

1.2   RTTT AND STATE-LEVEL POLICY ACTIVITY

The competitive aspect of the Race To The Top grant program attracted considerable attention in both the education and mainstream press (e.g. Dillon, 2009; McNeil, 2009; Shear and Anderson, 2009). And, as suggested by the reports from states in Chapter 4, many states were taken with the idea of winning, not only for the additional funding, which as explained above was relatively small, but for recognition. As such, states put considerable effort into the preparation of their applications. The deadline for Round 1 applications was in January 2010, less than a year after the creation of the program, and almost all state applications, with appendices, were over 1000 pages[4]. By late 2009, many states legislatures had passed significant education policy changes or were planning to introduce legislation to do so. States' legislative and policy changes included developing more comprehensive longitudinal data systems spanning across state agencies, linking student achievement and demographic data to their teachers and fellow students for the purpose of teacher and principal evaluation, evaluating and revising laws and regulations regulating teacher and school leader preparation programs and certification, and signing on to implement a new set of national common standards and aligned assessments.

Forty-three first and second round RTTT applicants made significant regulatory changes and twenty-three states enacted substantive reform legislation in the months before and after the first round application deadline. Some of the most detailed legislative and regulatory changes were made in areas related to teacher and school leader evaluation and to the provisions for addressing the needs of states' lowest performing schools. For example, in 2010, New York passed legislation that overhauled its teacher evaluation system, requiring the inclusion of value-

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[4] The final regulations for Race to the Top were published on November 18, 2009 and revised on January 27, 2010; state applications for Phase 1 funding were due January 19, 2010 (Race to the Top; Final Rule, 2009).

added student achievement growth scores in districts' evaluation and restricting the rights of teachers given low-performance ratings to appeal disciplinary action (New York Con. Ed. L., 2010). Tennessee, in its First To The Top legislation, fundamentally changed the teacher preparation and tenure system and created a new state-run Achievement School District, which removes the state's lowest performing schools from home districts and places them under the supervision of the state Department of Education (Tennessee Code Annotated, 2010). And Maryland, which did not apply in Round 1 but applied for and won Round 2 funding, passed comprehensive legislation that included overhauling the state's teacher evaluation system, requiring that 50 percent of teachers' annual evaluations be based on their students' achievement growth (Bimbaum, 2010).

1.3   RESEARCH QUESTIONS AND FRAMEWORK FOR THE ANALYSIS

The context for RTTT and the narrow time frame during which states could make policy changes, and the breadth and depth of the changes they made, gave rise to the central questions of this investigation. Specifically:

1. Is there evidence that states adopted policy ideas from other states? (horizontal diffusion)

    a. Did states look to states with which they shared demographic, political, or economic characteristics?

    b. Did states adopt policies similar to those in states perceived to be favorites to win the competition?

c. Did states that did not win Round 1, but who applied to round 2, adopt policies similar to those in Tennessee and Delaware after the announcement of their Round 1 awards?

2. Did state policymaking change in response to significant federal actions (e.g. the release of final program guidance)? (vertical diffusion)

3. Were there differences in state diffusion patterns across the three policy areas included in this study (teacher policy, college and career readiness policy, lowest-performing schools policy)?

To address these questions, this dissertation draws on policy diffusion theory, most prominently described by Walker (1969) and Berry and Berry (1990) in their investigations of state policymaking behaviors. While the diffusion theory of policy spread has been used extensively to examine the correlates of diffusion across states (horizontal diffusion), e.g. Berry and Berry (1992), Mintrom and Vergari (1998), Wong and Langevin (2007), and, more limitedly, between states and the federal government (vertical diffusion), e.g. Welch and Thompson (1980), Savage, (1985), Karch, (2010), the application of diffusion theory to examine policymaking behavior that could be influenced by both horizontal and vertical diffusion processes is much more limited. Federal influence on state policymaking behavior, vertical diffusion, is often treated as a nuisance for which the researcher controls, rather than as one of the phenomena under investigation. In this analysis, federal action, e.g. the release of federal program guidance or the announcement of Round 1 winners, may have had a significant influence on state policymaking behavior.

The analysis was conducted using a piecewise linear growth model employing a directed measure of policy distance between states as the dependent variable and taking into account state internal factors that prior policy diffusion research has identified as influential in the diffusion process, e.g. state's shared political ideology, per capita income, size, legislative professionalism, and interest group strength. The use of a directed state-dyad measure of state policy distance as the dependent variable, while unusual in state policy diffusion research, is guided by recent diffusion studies that have sought to untangle state diffusion processes more complex than the investigation of the pattern of one policy's spread across states (see, for example, Volden, 2006; Boehmke, 2009; and Gilardi and Füglister, 2008). The directed state-dyad measure has advantages over the dichotomous and event count variables most often used in previous diffusion research. With the inclusion of independent variables capturing state characteristics shared across the dyads or unique to either the policy sending or the policy receiving states, this form of the dependent variable allows for the investigation of the influence of states' internal characteristics and of the impact of the characteristics of states from which policy ideas could be adopted. In the context of state level RTTT-related policymaking, it is important to explore not only whether particular policies were adopted by multiple states but also to parse the impact of internal state factors, the interaction of state factors among states, the influence federal actions, and the differences in determinants of diffusion patterns for different types of policies.

In addition, the piecewise linear growth model employed for the analysis allows the comparison of effects of factors during the two time periods, from March 2009 through the release of the final federal program guidance in November 2009 (Time 1) and from December 2009 through the announcement of Round 2 winners in August 2010 (Time 2). Further, as this model of states' policy changes best fits the data, the model itself offers evidence of the impact

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of the explicit expression of federal preferences in the final program guidance on states'
policymaking behavior; the model dividing the "pieces" of state policy change at the point when
final guidance was released was a significantly better fit than other models (e.g. quadratic,
linear), as will be detailed in Chapter 3.

1.4   DATA FOR THE ANALYSIS

The data for the investigation are policies (both statutory and regulatory) in the 46 states that
applied for first or second round RTTT funding that were introduced and passed or approved
between March 2009 and August 2010. These dates were chosen to correspond to the passage of
ARRA, in which the four assurance areas were outlined, in February 2009 and to the awarding of
the first and second round of RTTT grants in March and August 2010, respectively. Policies
were examined to determine whether they fell into any of the three policy areas under
investigation (teacher policy, college and career readiness policy, and persistently lowest
achieving schools policies). Using Education Week's *EdCounts* policy indicators, each policy
coded for the presence or absence of each of the policy indicators. This process will be discussed
further in Chapter 3 and list of the policy indicators used can be found in the Appendix.

Additionally, this research incorporates state-level characteristics found to be significant
in prior diffusion research. These data include information about state economic and
demographic characteristics (e.g. population, per capita income, per pupil expenditures), other
measures of state capacity (e.g. legislative professionalism), state political climate (e.g. party
control of government, state ideology, strength of unions), and, of focal interest, variables
indicating a policy sending states' status as a Round 1 winner or perceived competition

frontrunner. These data are available through state and federal government websites and from prior research (e.g. Squire, 1997; Berry, Fording, Ringquist, Hanson, and Klarner, 2010).

1.5   IMPLICATIONS AND POLICY RELEVANCE

RTTT and states' policymaking behavior in response to it offer an opportunity to investigate policy diffusion and policy change in the context of the opportunity for, but not guarantee of, additional federal funding. This approach is distinct from compelling state policy change through sanctions and mandates, as was the case for states' NCLB-related policy. While the U.S. Department of Education has previously employed competitive grants on a small scale, RTTT is the first large-scale federal competitive grant program in education and allows for an examination of competitive grants as a policy tool for the federal government to push (or, as McGuinn, 2012, suggests, give political cover to) states to make broad changes to their elementary and secondary education policies. Further, as Manna and Ryan (2011) explain, across all policy areas much of the literature investigating competitive grants focuses on state-administered competitive grant programs for municipalities; RTTT is an opportunity to better understand competitive grants as a federal policy tool and as a potential influence on policy diffusion processes.

Additionally, by comparing the results across three policy areas (teacher policy, college and career readiness policy, and persistently lowest achieving schools policy), we gain insight into the differential impact of federal attention to particular policy areas that had previously received varying state-level attention. While state-level college and career readiness policy had received considerable attention from non-governmental organizations (e.g. Achieve) and states'

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persistently lowest achieving schools policies were influenced by other federal non-competitive funding streams (e.g. NCLB and School Improvement Grants), prior attention to teacher evaluation and compensation policy had concentrated almost entirely on district-level policies through grants such as the USDOE's Teacher Incentive Fund and the Gates Foundation's Measures of Effective Teaching. The use of both the piecewise linear growth model and the directed-state dyad dependent variable enables these investigations.

Additionally, while there is a reasonable amount of education policy research that examines the impact that federal education policy making has had on state education agencies (e.g. Furhman, Cohen, and Mosher, 2007; Manna, 2010), there is little that examines where states look for policy ideas in response to federal pressures or incentives. And, in the field of diffusion/emulation research, most education policy studies have focused on the diffusion of higher education policies (e.g. Cohen-Vogel, Ingle, Albee, and Spence, 2005; Doyle, 2006; McLendon, Hearn, and Deaton, 2006) or charter school/school choice policies. The lessons from these prior lines of research are applicable to the current study, but not necessarily transferrable.

The goal of understanding these processes is to gauge the influence of a relatively small amount of federal spending on state policymaking; if states responded to the competitive grant program by adopting policies that were reflective of federal preferences, then it would be reasonable to label RTTT as "successful" in achieving state cooperation with federal policy agendas without the use of mandates. If states adopted policies from other states, were these decisions related to the states' shared characteristics? Or did state decisions appear to be influenced by perceptions of other states' frontrunner status or by the announcement of the first round winners? While, as Nicholson-Crotty and Staley (2012) state, it will be years before any evaluation can connect RTTT to student-level impacts, in the meantime, understanding state

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policymaking processes helps to clarify whether states adopted policies informed by their unique contexts, which we expect to be more likely to be successfully implemented, or if policy decisions appeared to be driven more by competitive and financial concerns.

1.6   CHAPTER OUTLINE

The chapters that follow will further unpack the theoretical model and methods proposed for this analysis. Though scholars have proposed a number of frameworks through which to examine state policy making, I suggest that theories such as punctuated-equilibrium and multiple streams are best for understanding the events that put policy changes on legislative or administrative agendas. This analysis focuses not on agenda setting but on policy adoption processes.

Policy diffusion theory is uniquely suited to investigate policy adoption events. RTTT offers researchers a opportunity to study state policy making in a case where the reasons for state-level policy attention to the four assurance areas is somewhat straightforward; the federal government, in a year of shrinking state and local revenues, offered an opportunity for additional funding and gave states the political cover to implement policies that could be too politically onerous in the absence of that incentive. Unlike prior federal funding mechanisms, i.e. Title I funding, RTTT offered states neither the guarantee of funding nor mandates for the specific policies they would be required to pass. Though widely misreported and misperceived to have these mandates, there was only one absolute requirement for states to receive funding[5]–that state

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[5] It was widely perceived that states with charter school caps could not win the competition. In fact, states such as Arizona, with lenient charter school laws did not receive funding while states with charter school caps won awards. Massachusetts, which caps the number of charter schools at 120, finished first in the second round of the competition.

regulations allow the linking of teachers and principals to their students' achievement. This absence of federal mandates, coupled with the compressed timeframe for applications, presents an opportunity to use diffusion theory to understand rapid education policy change.

Chapter 2 discusses theories of policy change, focusing significant attention on policy diffusion theory and prior diffusion research findings. These findings guide the selection of the independent variables for this analysis. Chapter 3 details the methodology for the analysis, beginning with a review of the methods and models used in prior diffusion research. I then introduce the dependent and independent variables, data, and the piecewise linear growth model, with particular attention to the dyadic dependent variable. The chapter concludes with a check of model assumptions and a discussion of limitations of this study.

The first findings chapter, Chapter 4, delves into the policies states adopted and the context for those adoption decisions. I present qualitative vignettes describing the political and legislative processes in five states during the first two rounds of RTTT. These short studies of states, drawn from state media sources, offer both a view into state processes and a frame for the quantitative findings from the growth model, which are presented in the second findings chapter, Chapter 5. These findings are discussed first for each time period in each policy area, and then more broadly, making comparisons of the findings among teacher policy, college and career readiness policy, and persistently lowest achieving schools policy across the two time periods analyzed. Finally, I conclude by noting the significant findings of the study and suggesting the significance of these findings for state and federal policymaking.

2 THEORETICAL MODELS FOR UNDERSTANDING STATE POLICY CHANGE AND FINDINGS FROM PRIOR RESEARCH

As McLendon and Cohen-Vogel (2008) explain in their review of education policymaking in the U.S., three theories (multiple streams, punctuated equilibrium, and policy diffusion) are best suited to understand systemic education policy formulation and change at the state level. But while these theories are prominent in the broader policy and political science fields, they have been underutilized in framing research on education policy change.

In examining Race to the Top, it will be important to understand policy change at the state level in order to identify the markers of success for the federal program. The stated purpose of Race to the Top is to encourage states to make significant education reforms and to foster innovation in state education policymaking in the short term in order to propel student achievement in the long term. Did Race to the Top inspire or coerce states into making policy changes, and, if so, were those changes influenced by internal state characteristics, e.g. union strength, economic conditions, external organizations, and ideology, which led to the development of innovative policies mindful of those characteristics? Did state policy changes appear to be borrowed from other states that were perceived as education leaders or innovators? The education system in the United States is, to adopt a phrasing from Manna (2008), fractured both horizontally and vertically; education governance in each state may be somewhat unique, shaped by the state's history, characteristics, politics, interest groups and culture. Questions

about the origin of state policies are relevant because each state's context may influence the implementation and success of the adopted policy in the long term.

Briefly, punctuated-equilibrium and multiple streams theories are characterized by Sabatier (2007) as appropriate to "describe policy change within a given political system or set of institutional arrangements" and by McLendon and Cohen-Vogel (2008) as best to understand the process through which an issue makes it onto politicians' and policymakers' agendas. Multiple streams theory focuses on three "streams" of activity in government: the problem stream; the policy stream; and the politics stream. Changes to the policy agenda occur when an event (or series of events) leads to these streams' convergence, which creates an opportunity for a problem to be linked to a policy solution in a political environment conducive to change (Kingdon, 1984; Zahariadis, 2007). Punctuated equilibrium theory posits that policymaking in established policy areas remains relatively static over long periods of time, punctuated by short bursts of intense change. These bursts of significant change occur when advocates in a policy arena succeed in finding an appropriate and receptive policymaking venue and in defining (or redefining) the image of their issue in a manner that is broadly appealing and that encourages politicians to associate with the issue (True, Jones, and Baumgartner, 2007). Finally, policy diffusion theory suggests policies diffuse among states when states seek to copy policies perceived to be successful elsewhere, act in response to resource competitions with other states, or react to citizen pressure (Berry and Berry, 1997, 2007).

The following chapter will explore these theories in greater depth, focusing most intensively on the theoretical framework chosen for this analysis, policy diffusion theory, and the findings from the policy diffusion literature relevant to examining horizontal and vertical diffusion processes.

2.1   THEORIES OF AGENDA SETTING AND POLICY CHANGE

2.1.1   Multiple Streams Theory

Kingdon's (1984) multiple streams theory, also known as the Revised Garbage Can framework, focuses on explaining why some issues rise to prominence or take on an air of urgency for policymakers while other issues remain relatively obscure. In addition to explaining how policy agenda change occurs, the theory offers an explanation of the actors and the processes that match a policy problem to a policy solution, or, as Kingdon explains, when a policy solution, promoted by a policy entrepreneur, seeks a policy problem. The theory's name, multiple streams, refers to Kingdon's conception of the policymaking field as comprised of three streams running through government, operating relatively independently.

The problem stream "contains" the problems that have been selected and defined by policymakers as worthy of action or attention. The politics stream is conceived of as the political context in which policymakers work and includes public opinion, interest group politics, elections, and prevailing national or state ideology. And the policy stream consists of the policy proposals developed by special interest groups or experts in specific policy areas. At times when there is little attention to a policy issue area, "policy solutions" in the policy stream are, essentially, solutions without problems. As Kingdon describes the process, only when these three streams converge is there the possibility for policy change to occur. A political event, an event that shifts public opinion, or successful advocacy by a strong special interest groups leads to the linking of a problem and a solution in a receptive political environment. McLendon and Vogel (2008) offer a particularly sharp summary of Kingdon and other garbage can theory scholars: "agenda setting [is a] collection of choices looking for issues, problems looking for

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decision situations in which they may be aired, solutions looking for problems to which they may become the answer, and politicians looking for pet problems or policies by which they may advance their careers" (p. 33).

Multiple streams theory is most often utilized to understand the process through which a problem and a solution make it on to the policy agenda. Zahariadis (2007) describes the theory as flexible and capable of incorporating variation in agenda and policy processes and able to account for the multiple perspectives that influence these processes. And because it is particularly well-suited to understanding policymaking under time constraints (policy entrepreneurs, as described above, are lying in wait for a opportunity to promote their pet project), it may seem appropriate to look at state level policymaking in response to the Race to the Top program through the multiple streams lens. However, as McLendon and Cohen-Vogel (2008) and Zahariadis (2007) explain, it has proved most useful in understanding the emergence of an issue and in analyzing single policy cases. This proposed research is intended to investigate where state policymakers looked for the policies they adopted and is not focused on the process that brought education issues to state policymakers' attention.

2.1.2 Punctuated Equilibrium Theory

The punctuated-equilibrium framework for understanding policy change is most closely associated with the work of Baumgartner and Jones (1993). Within this framework, policymaking is not conceived of as an incremental process of slow, progressive change, but, rather, as a system that supports the creation of policy monopolies that ensure long periods of stasis. When these monopolies are disrupted, for example as a result of political or social change, issues within the policy area are subject to increased attention; this leads to a short burst of rapid

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policy activity and change, after which the policy area returns to a state of equilibrium (True, Jones, and Baumgartner, 2007; McLendon and Cohen-Vogel, 2008). As a result of policy change, new policy monopolies may take hold, acting much like the previous policy monopoly.

Critically, the punctuated-equilibrium framework defines "venues" and "images." True, Baumgartner, and Jones (2007) describe the spaces in which policymaking occurs as "venues;" they can exist at any level of government and overlap across levels of government. Each venue is understood to have its own dominant policy monopoly, protecting the status quo. "Images" are described as "a mixture of empirical information and emotive appeals […], in effect, information–grist for the policymaking process" (p.161). When a new actor disrupts the status quo in a policy venue, or a policy image can be compellingly redefined, punctuated-equilibrium theory suggests there will be rapid policy change. Scholars propose that the U.S.'s unique patchwork of overlapping jurisdictions, multiple levels of government, and many executive, judicial, and administrative agencies within those levels creates the perfect context in which to observe this iterative cycle of change and stasis (Baumgartner and Jones, 1993; True, Baumgartner, and Jones, 2007).

However, much like multiple streams theory, the punctuated-equilibrium framework may be better suited to explanations of agenda setting rather than for understanding why policymakers adopted particular policies in pursuit of Race to the Top funding. This is not to suggest that punctuated-equilibrium and multiple streams theories are not appropriate for understanding the federal development of the Race to the Top criteria and, for example, the change in approach toward underperforming schools that accompanied the Obama administration's move into the Department of Education. Rather, the proposed study is focused on state-level policymaking decisions to adopt particular policies drawing data from multiple

time points, and operates under the assumption that the potential for additional federal funding at a time when states were beginning to feel the effects of an economic recession was sufficient to place the Race to the Top proposal and education policy on states' agendas.

2.1.3 Policy Diffusion Theory

Unlike the theories of state level policymaking described above, policy innovation and diffusion theory evolved specifically to address policy adoption, not to explain the process through which an issue makes it on to legislative agendas. In examining education state policymaking between the proposal of Race to the Top and the close of the second round of the initial Race to the Top competition, the primary agenda setting process occurred at the federal level. At the state level, Race to the Top very quickly drew significant attention as state governments recognized the opportunity to receive federal grant money, and the broad parameters for their attention had already been defined for them (Klein, 2009).

During the year and a half span of the first two rounds of the competition, forty-three states made at least superficially significant education policy changes in multiple policy areas, e.g. to teacher policies, school leadership policies, college and career readiness definitions, and policies stipulating supports and consequences for low performing schools. Given the rapid pace of policy changes during this time period, the questions of interest are related to whether states looked outside of their borders for policy ideas, whether those new policies emulated those in other states or reflected federal preferences, and whether any diffusion that occurred was systematic and related to states' similar characteristics or perceptions of states' education successes. These questions suggest the need for a framework suited for examining the adoption process; as such the remainder of this review will focus on policy diffusion and innovation

theory, detailing the basic framework, the development of the theory in public policy literature since the late 1960s, and the expansion and evolution of the theory. While studies of diffusion and innovation processes can be found in many disciplines, the focus will be on policy diffusion in the U.S. states.

Walker (1969) is most often credited with initiating the application of individual and organizational theories and definitions of innovation and diffusion associated with Mohr (1969) and Rogers (1962, 2003) to explain the factors associated with states' adoption of new programs and the spread of policies across states. Rogers (1962, 2003) defined diffusion as the "process by which an innovation is communicated through certain channels over time among members of the social system." In the public policy context, Walker (1969) defined an innovation as a policy that is new to the jurisdiction adopting it, regardless of whether it had been adopted in another jurisdiction previously, and defined diffusion as the spread of policies across jurisdictions. In his study, Walker (1969) investigated whether certain states were more likely to adopt new policies dependent on their level of development (the proportion of their population living in cities and the state's level of industrialization), availability of financial resources, and residents' educational attainment, as well as if states were more likely to adopt policies similar to those in states with which the state shared socio-demographic, political, and economic characteristics.

While Walker's (1969) and Gray's (1973) work was formative, the theory expanded both conceptually and methodologically with the publication of Berry and Berry's (1990) study of the diffusion of lottery policies across states. Berry and Berry's (1990) work found that earlier diffusion research models, by analyzing "internal determinants"[6] and "diffusion"[7] separately,

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[6] Internal determinants models test for the likelihood of a state to adopt a new policy or program based on its socio-demographic, political, and economic characteristics. These models assume no interaction or learning among states.

failed to account for the interrelatedness of the states' characteristics and the likelihood of that states may look for policy solutions in states with similar characteristics and similar policy problems. They proposed a unified model of diffusion and innovation that could address the multiple influences on state policymaking decisions. As Berry and Berry (1997, 2007) explain, this unified model can address the three reasons why states may emulate one another: learning from other states evidenced by states borrowing policies perceived to be successful elsewhere; competition as states may borrow from other states in response to perceived economic threats or advantages; and coercive and normative pressure to conform to mandates from the federal government or to the best practices of other states. Additionally, their model takes into account the characteristics of states that may make them more likely to adopt new policies, available resources, obstacles to innovation, and the presence of other policies that may bias a state's policymaking behavior, in line with Mohr's (1969) framework and Roger's (1962, 2003) work. Subsequent research has built on this model and expanded it to better understand diffusion among states and between states and the federal government.

2.2   POLICY DIFFUSION THEORY LITERATURE

2.2.1   History of policy diffusion research

As mentioned above, Walker's (1969) and Gray's (1973) articles propelled more widespread application of diffusion and innovation theory to public policy research. Both Walker (1969) and

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[7] Pure diffusion models, known as Neighbor and Regional Diffusion models, assume that geography and states' proximity dictates their policymaking behavior without taking into account the influence of states' characteristics.

Gray (1973) investigated state innovativeness, which Walker measured as an "innovativeness" score derived from states' order of adoption of 88 policies, and Gray measured by placing the states in rank order by time of policy adoption in three issue areas. These early approaches were somewhat limited methodologically but were highly influential. The integration of Mohr's (1969) and Roger's (1962, 2003) descriptions of diffusion and the adoption of innovations to policy research has driven policy diffusion research through the present day.

The patterns of diffusion that Walker (1969) and Gray (1973) describe followed an S-shaped pattern when plotted visually. When the elements of diffusion that Rogers (1962, 2003) described (an innovation, a communication system, a social system, and time) are present, we would expect to see a small number of states adopting the policy initially, followed by a steep increase as more states learn of the policy, perceive it to be a solution to a policy problem and adopt it, and, finally, a leveling off of the number of adopters as the number of potential adopting states decreases.

Not all policy diffusion events follow this pattern, however, and, in the 1980's, scholars began investigating variations to the diffusion patterns that Walker (1969) and Gray (1973) described. For example, neither Walker (1969) nor Gray (1973) fully explored instances of rapid diffusion (policy diffusion in the span of a couple of years, rather than a couple of decades) or of vertical diffusion (diffusion between cities and states or the federal government and states). Savage (1985) and Welch and Thompson (1980) investigated the impact of federal incentives and intense attention on a particular issue area. Their research confirmed some earlier findings but also demonstrated that diffusion could be understood as a rapid process, encouraged or discouraged by federal actions and incentives. Still, diffusion studies in the 1980s suffered from

the same methodological problems as earlier research by possibly confounding the effects of internal determinants with the impact of external forces.

As discussed in the previous section, diffusion research benefitted methodologically and conceptually from the publication of Berry and Berry's (1990) study of the diffusion of lotteries across states. This paper initiated the use of event history analysis for understanding diffusion patterns and added a unified model to capture the likelihood of a state to adopt a particular policy. The authors integrated Mohr's (1969) and Roger's (1962, 2003) frameworks as well as Mahajan and Peterson's (1985) classification of existing innovations (independent, complementary, contingent, substitutes). This unified model allowed researchers to investigate both internal determinants and the influence of external pressures jointly, better capturing the effect of these phenomena to understand state policy adoption behavior, addressing one of the common criticism of findings of earlier diffusion studies.

Berry and Berry's (1990) work initiated a tremendous expansion of policy diffusion research. Researchers have utilized increasingly complex methodological and conceptual innovations to capture the factors that may influence vertical and horizontal policy diffusion and the complex temporal patterns that policy adoptions may follow during those diffusion events. These methodological developments allowed for the exploration of jurisdictions' motivations to adopt policies similar to those previously adopted by other governments (c.f., Berry, 1994; Boehmke and Witmer, 2004, Grossback, Nicholson-Crotty, and Peterson, 2004), the influence of communication networks and policy entrepreneurs on policy diffusion (c.f. Balla, 2001; Mintrom and Vergari, 1997; Mohker, 2010) the mechanisms that may influence the adoption process (c.f. Shipan and Volden, 2008; Renzulli and Roscigno, 2005), the role of federal action in a policy area on diffusion processes (c.f., Allen, Pettus, and Heider-Markel, 2004; Karch, 2006; McCann,

Shipan, and Volden, 2010) and the directionality of policy diffusion (c.f. Shipan and Volden, 2006). Specifically within the field of education research, scholars have most often investigated the diffusion of charter school legislation across states (for example, Mintrom and Vergari, 1998; Renzulli and Roscigno, 2005; Wong and Langevin, 2007), of merit-based college scholarships (Doyle, McLendon, and Hearn, 2010; Ness and Mistretta, 2010), and structural reforms (Mohker, 2010).

Methodologically, scholars have refined and further specified Berry and Berry's (1990) model to further account for the multiple influences on the diffusion process. For example, Boehmke and Witmer (2004) created a model to better understand the differences between horizontal diffusion processes driven by social learning as states adopt policies as a result of perceived policy success in other states and processes that are the product of states adopting a policy in reaction to the perception of an economic threat from other states. Further, Berry and Baybeck (2005) and Baybeck, Berry, and Siegel (2011) explored interstate competition by modeling policy diffusion using geographic information systems (GIS) to understand how population distribution throughout a state influences policy adoption and diffusion processes. Shipan and Volden (2008) and Maske and Volden (2011) modeled the mechanisms that drive diffusion processes among states, among cities within a state and between cities and states. In another important methodological paper, Buckley and Westerland (2004) introduced models to better understand time dependence in state-level policy diffusion. And, perhaps most importantly for this dissertation research, Volden (2006), Boehmke (2009), and Gilardi (2010) employed the directed state-dyad dependent variable to parse the direction of policy adoptions, i.e. does state A borrow a policy from state B.

In sum, since Walker's (1969) and Gray's (1973) influential studies of policy diffusion among U.S. states, research has addressed an increasing number of diffusion scenarios and expanded beyond looking for correlates of states' likelihood to adopt new policies to address the "why" of diffusion. These conceptual developments have come in conjunction with the growth of quantitative models to capture the complexities of horizontal and vertical diffusion and the mechanisms that may influence diffusion processes. In particular, Berry and Berry's (1990) introduction of event history analysis has allowed for the more precise specification of policy diffusion, integrating the previously distinct models of internal determinants and geographic proximity. The following section will explore the mechanisms and processes that this research has illuminated.

2.2.2   Diffusion processes and mechanisms

This section will address the types of policy diffusion researched and the mechanisms identified as driving those processes. As described earlier, prior to Berry and Berry's (1990) work, scholars analyzed models of internal and external influences on state policy adoption separately. As these horizontal and vertical diffusion processes were conceptualized as distinct, vertical diffusion models will be discussed separately. While models of horizontal diffusion share some characteristics with vertical diffusion models, vertical diffusion has not received as much attention as horizontal diffusion, and even fewer studies have examined the effects and interaction of both horizontal and vertical diffusion processes. Finally, in addition to a further description of the types of diffusion examined in previous research, this section will describe the mechanisms (and motivations) for diffusion identified by Shipan and Volden (2008) and Berry and Berry (1997, 2007).

2.2.3 Horizontal diffusion models

Horizontal diffusion refers to the diffusion of policies among governments at the same level in the governance hierarchy, i.e. from city to city or from state to state. This cluster of models includes internal determinants, isomorphism, national interaction, neighbor or regional diffusion, and leader-laggard models (Berry and Berry, 1997, 2007).

2.2.3.1   Internal determinants.

Internal determinants models, in their pure form, assume that each state adopts policies for reasons that can be entirely explained by factors internal to the state; models are constructed to account for economic, political, and socio-demographic factors within a state that the researcher believes contribute to the likelihood a policy adoption. Berry and Berry (1997, 2007) state that this pure form is unrealistic, supposing that there is no communication between states about policy ideas or policy problems. They suggest that "internal determinants models must acknowledge that, when a state adopts a policy new to the American states, media coverage and institutionalized channels of communication among state officials make it likely that knowledge of a policy spreads to other states" (p. 232). There are few recent examples of pure internal determinants models in research. However, Berry and Berry (1997, 2007) suggest a less stringent form of the model which assumes that while states may communicate with other states, policy adoption decisions are motivated primarily by states' internal conditions and characteristics and not motivated by competition with or learning from other states' policies.

2.2.3.2   Isomorphism models.

Isomorphism models build on the assumption that states' policy adoption decisions are influenced by information from other states that are similar in political, socio-demographic and economic factors (Berry and Berry, 1997, 2007). These models propose that states learn about policies by looking to similar states, doing so to gain information about policy success in under conditions similar to their own. Research suggests that shared ideology between states may be a particularly important in these models, as politicians look to other states not only to understand policy success but also electoral ramifications (Grossback, Nicholson-Crotty, and Peterson, 2004). Isomorphism models also may address instances of rapid policy diffusion similar to those investigated by Savage (1985). He suggests that that policy changes may occur as states attempt to "emulate virtue" in other states; policymakers adopt policies because other states are doing so, not for reasons that are clearly tied to economic or political advantage (e.g. adoption of seat belt laws).

2.2.3.3   National interaction models.

National interaction models assume that, through formal and informal national networks or organizations, such as the Education Commission of the States or National Governors Association, state policymakers interact and share policy ideas. Interactions between officials from states that have adopted a policy and officials from states that have not are believed to increase the likelihood that non-adopting states will adopt a policy. Further, the likelihood that a state will adopt a policy is assumed to increase with every additional state's adoption of the policy, regardless of the geographic proximity of the adopting and non-adopting states (Berry and Berry, 1997, 2007). As Berry and Berry (1997, 2007) explain, pure national interaction models rest on the assumption that all state actors are essentially the same, that all non-adopting

states are equally likely to adopt a policy, and that interactions between officials are random. However, these assumptions ignore the fundamental differences between states and state officials, and assuming, for example, that policymakers from Oregon are just as likely to interact with officials from Alabama (and adopt a policy that Alabama has adopted) as are officials from Mississippi to interact with and get ideas from policymakers from Alabama. Given the demographic, cultural, and economic differences across states, this is a somewhat difficult assumption to support. Nonetheless, the national interaction model is significant in that it serves as a counterbalance to the assumption of that states that share a border or a geographic region will only look to geographically proximate states for policy ideas, as is assumed by the neighbor or regional diffusion models discussed below.

2.2.3.4   Neighbor or regional diffusion models.

Neighbor or regional diffusion models are used to represent the regional effects or impact of states sharing a border on states' policy adoption behavior. While national interaction models assume random interaction and similar effects of interactions among all states, neighbor or regional diffusion models focus on the impact of states that share a border or a region on policy adoptions (Berry and Berry, 1997, 2007). For example, regional or neighbor models can be used to evaluate the impact of other states' adoptions on policymakers' decisions to adopt lottery, gambling, or tax or incentive policies (for example, Berry and Berry, 1990, 1994; Boehmke and Witmer, 2004; Ness and Mistretta, 2010). These models tend to focus on the effects of learning and competition on policy decisions.

Karch (2006) notes that research examining regional or neighbor diffusion effects makes the assumption that sharing a region or a border makes states more likely to adopt policies from one another. And while this assumption may hold for policies that concern economic competition

tied to geographic proximity, such as a lottery, it may not hold for policies, even economic policies, that are perceived to have national implications, such as a corporate tax or incentive. Volden (2006) and Grossback, Nicholson-Crotty and Peterson (2004) found that neighbor and regional effects in the policy areas they examined (Children's Health Insurance Program policies and lottery, education, and criminal sentencing policies, respectively) were better explained by bordering states' economic, demographic, and cultural similarities. State policymakers were more likely to adopt policies that they perceived as successful in state contexts similar to their own, regardless of location.

2.2.3.5   Leader-laggard models.

Leader-laggard models assume that certain states can be identified as leaders in a policy area and that states are more likely to look to "leader states" for policy ideas. By making the assumption that leader states influence other states by virtue of their leadership, these models tend to discount the effects of interstate competition and isomorphic pressures on state policymaking (Berry and Berry, 1997, 2007). However, leader-laggard models are not incompatible with regional diffusion models; some researchers have chosen to integrate the two models, identifying leader states within regions (for example, Walker, 1969).

Research employing leader-laggard models requires an a priori prediction of the expected leader state or states, else, without a specification of leader states or the characteristics of expected leader states, these models are not empirically testable. Berry and Berry (1997, 2007) suggest that these models can be conceptually distinct from other models and fully testable when the researcher has as an a priori assumption about the hierarchy of states on a given characteristic. Further, leader-laggard models are very similar to vertical diffusion models, with the federal government acting as the "leader state."

As discussed above, research prior to 1990 tended to analyze the horizontal diffusion models in isolation. Researchers would focus either on internal determinants of policy adoptions or on diffusion within a geographic region, ignoring the possibility that the policy diffusion could involve an interaction between state characteristics, isomorphism pressures, and regional or neighbor influences, or that the effects of these interactions could be different across policy areas. While it may be a reasonable assumption that New York's adoption of a less stringent beer and wine sales law would impact New Jersey's decisions about its beer and wine laws, the assumption would not hold if New Jersey were replaced with Arizona in that scenario. Alternately, while the passage of a beer and wine sales policy may not influence the policies of geographically distant states, plausible scenarios can be constructed in other policy areas where there would be national effects of a state's policy adoption. For Race to the Top related policymaking, it is possible that state policymakers looked to states that were socio-demographically, economically, and ideologically similar for policy ideas, regardless of geographic proximity[8]. It is also possible that states looked solely to the federal government for policy ideas, in keeping with a vertical diffusion model.

2.2.4   Vertical diffusion models

Vertical diffusion models can be used to test diffusion effects across levels of government. For example, they can be employed to understand the influence of city's policies on state policies (e.g. Shipan and Volden, 2008) or of the federal government on state policymaking (e.g. Welch and Thompson, 1980; Karch, 2006; Karch, 2010). Vertical diffusion models employ many of the

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[8] In fact, during the model building process discussed in Chapter 3, the variable indicating whether states shared a border was so highly insignificant that it was dropped from the final models.

same analytic methods and independent variables to capture state characteristics as horizontal diffusion models, and Berry and Berry (1997, 2007) note that vertical diffusion models are conceptually similar to leader-laggard models, assigning the role of leader to the higher government. Still, researchers have considered other manifestations of vertical policy influence, for example investigating the influence of city level policy adoption on state policy action. Shipan and Volden (2008) investigated the effect of city adoptions of anti-smoking regulations on state adoptions of anti-smoking policies. Additionally, some research has investigated the effect of federal action on state-to-state diffusion processes (McCann, Shipan, and Volden, 2010).

When the federal government takes coercive action, vertical diffusion models are somewhat uninteresting, as Berry and Berry (1997, 2007) note. More interesting models of vertical diffusion investigate the influence of the higher government when the direct rewards are not obvious or when the policy messages are somewhat opaque. For example, Karch (2010) investigated the effect of different types of policy action at the federal level regarding stem cell research and the different impacts each of those actions had on state-level policy adoption behavior.

Additionally, scholars have investigated state-level policy diffusion when policy choices are somewhat constrained by federal guidelines, e.g. welfare (TANF) reforms implemented in the mid-1990s (Lee, 2009) and changes in policies related to states' implementation of the Children's Health Insurance Program (CHIP) (Volden, 2006). Research on both TANF and CHIP policies bear on research of Race to the Top related policy behavior, as all three involve federal grantmaking and the influence of federal grants on states' behavior. Regardless of whether effects of federal action on state-level policymaking were detected, the findings have

federal policy implications. Had the states made policy changes reflecting federal policy preferences, there would be evidence to support the continued use of federal grants and, specifically, of competitive grants as a federal policy tool. Conversely, if there were no evidence of changes in states' behavior or of any substantive movement toward federal policy preferences, the usefulness of this type of federal grant-making for the purpose of influencing states would need to be considered.

Many of the models in the above discussion of horizontal diffusion models were developed to understand the correlates of state policy diffusion. Particularly prior to 1990, most diffusion research treated the state as the unit of analysis. Since the shift to using the policy as the unit of analysis, some researchers have begun to investigate states' motivations for adopting policies similar to those adopted by other states and whether certain policy attributes appear to influence states' likelihood to adopt policies. The next section will review the still somewhat limited research into diffusion mechanisms and policy attributes, which should be understood as components of all the models discussed above.

2.2.5   Policy diffusion mechanisms and policy attributes

While it may be interesting to explain the state characteristics that influence the likelihood of state adoption of policies and the spread of policies across states, exploring underlying mechanisms of the diffusion process and the influence of policy attributes on that process begins to address the "why" of policy diffusion. In other words, given all possible policy choices, why do states choose to adopt a new policy when there are other options, including doing nothing? This section will introduce the limited research on the "why" of policy diffusion, and, while

these mechanisms are described in isolation, they should be understood as acting and interacting to impact policy diffusion.

Berry and Berry (1997, 2007) discuss three reasons why states may emulate the policies of another state: learning, competing, and conforming. They describe learning as a product of state policymakers' desire to find new ideas to pressing policy problems. By borrowing existing policies in other states, policymakers can simply the process of finding new information. Emulation may allow for shortcuts or information about the ramifications of policy adoption given a similar set of conditions. Competing, or competition, captures the tendency of states to borrow from other states when there is the perception that doing so will offer economic advantage or will avoid competitive disadvantage. For example, when a state reduces social benefits, bordering states may feel pressure to reduce benefits as well, fearing that failure to do so would result in an influx of beneficiaries moving to the state with the best benefits. This pattern has held for research into the diffusion of lottery and gambling policies, social benefit reforms, and corporate tax and incentive programs (Lee, 2009; Berry and Berry, 1990; Baybeck, Berry, and Siegel, 2011). Additionally, Berry and Berry (1997, 2007) discuss the pressure that states may feel to adopt policies for which other states or the federal government advocate.

Berry and Berry make a distinction between "coercive" pressures and "normative" pressures (which Savage [1985] described as "emulation of virtue"). Coercive pressures are associated with federal mandates. For example, the No Child Left Behind Act mandated that any state not implementing an achievement testing and reporting system would risk the reduction or elimination of federal Title I funding. While Title I funding comprises a relatively small proportion of states' education budgets, states complied with the law rather than face the consequence of losing the funding on which many schools relied. It is important to note,

however, that not all federal action is coercive; RTTT had no explicit threat attached to states' policymaking decisions. Similarly, the federal stem cell policy actions Karch (2010) researched were not mandates and had no negative or positive financial impact on states.

"Normative" influences can be understood as the isomorphic pressure that states may feel to conform to the norms of other states when there is no clear negative or positive implication for policy adoption. National professional networks (e.g. National Governors Association, Council of Chief State School Officers) and national advocacy or lobbying groups (e.g. the National Council of La Raza, the American Federation of Teachers) may contribute through the spread of information about policies and by increasing the normative pressure on states to adopt policies that are being adopted in other states (Balla, 2001, Mohker, 2010).

These motivations for state adoptions are similar to the mechanisms described and investigated by Shipan and Volden (2008) with data on anti-smoking policy adoption behavior, primarily at the city level, (though their framework has been applied to state-level policymaking as well). They describe four diffusion mechanisms that may influence governments' policy adoption behavior: learning; economic competition; imitating; and coercion. The authors describe learning as fundamental to the belief that states can act as policy laboratories. States can observe policies, the implications of their passage, and the courses of implementations in other states and use that information to make decisions about adopting particular policies in their own state. A policy's diffusion rate is believed to accelerate as more governments adopt it, giving non-adopting governments the opportunity to observe the effects of the policy in more diverse contexts. Economic competition is discussed as the prospective evaluation in which policymakers engage in order to understand the negative or positive economic impact of a policy were it to be adopted. An expectation of negative economic consequences given the experiences

of other jurisdictions, for example, would reduce the likelihood of policy adoption. The imitation mechanism fits with the leader-laggard horizontal diffusion model and vertical diffusion model discussed in the previous section; some jurisdictions are regarded as leaders and other jurisdictions look to those governments for policy ideas. For example, California has been regarded as a policy leader in environmental policy, often serving as the leader even for the federal government. Shipan and Volden (2008) define coercion similarly to Berry and Berry (2007) as mandates or threats that lead states or municipalities to adopt particular policies. Finally, the authors test these mechanisms conditionally and temporally to understand if the effects of these mechanisms are mediated or moderated by characteristics of the jurisdiction and by time since the first or a significant prior adoption.

In addition to the examination of the mechanisms of diffusion, researchers have begun to revisit underexplored aspects of Berry and Berry's (1990) unified model of diffusion. Specifically, Maske and Volden (2011) analyzed a sample of criminal justice policies passed between 1973 and 2003 in U.S. states to understand how the learning and competition mechanisms were influenced by Roger's (1962, 2003) typology of the attributes of innovations (relative advantage, compatibility, complexity, observability, and trialability). While their research is preliminary, it highlights the need to understand the multiple influences on state policymaking behavior and policy diffusion processes.

Much of the research investigating diffusion mechanisms focuses on the effect of economic competition, though there is increasing research attempting to understand the process through which policymakers learn about policy success and failure in other states. The diffusion of gambling and lottery laws in the late 20th Century and the early 21st Century have offered scholars clear examples of diffusion tied to the perception that the failure to copy legislation in a

nearby state will be economically disadvantageous. However, several researchers have investigated the effect of policymakers' learning on the diffusion of particular policies in areas not obviously related to economic motivations using qualitative methods. For example, Volden (2006) interviewed state officials in order to understand their decisions to adopt CHIP policies similar to those in other states. And Cohen-Vogel, Ingle, Levine, and Spence (2007) questioned state officials about their states' adoption (or non-adoption) of state merit-aid policies for higher education. Further, Maske and Volden's (2011) recently published work should push the field to further explore the influence of policy attributes and the effects of interactions between attributes and the mechanisms that Shipan and Volden (2008) and Berry and Berry (1997, 2007) describe.

2.3   FINDINGS FROM PRIOR HORIZONTAL AND VERTICAL POLICY DIFFUSION RESEARCH

As discussed above, of the three most often used theories of state-level policymaking, policy diffusion and innovation theory is uniquely suited to the proposed investigation. While other theories can be employed to understand policy agenda setting, diffusion theory serves to explain policy adoptions. During the application period for Race to the Top, the most interesting questions are not why education policy made it onto states' agendas, as the potential grants were most likely sufficient to attract state lawmakers' attention, but, rather, why the states opted to adopt particular policies. Were these decisions based on observations of successful policies in other states, driven by federal education priorities, or were they rooted in the state's prior educational reforms? The answer may offer clues about expected outcomes as states implement reforms and can offer some evidence of whether a competitive grant program is a sufficient

federal policy tool to encourage states to enact reform policies in line with federal policy preferences. Much of past federal education policymaking has relied on formula grants and mandates (e.g. Title I/ No Child Left Behind or Special Education funding) to drive state reform, but the RTTT competitive grant model may be a less overtly coercive option if it achieves some measure of success. While policy diffusion theory cannot evaluate long-term educational outcomes, it can be employed to understand state educational policy decisions and the role of federal preferences and state conditions in those decisions.

The following sections will review researchers' findings from policy diffusion studies of horizontal and vertical diffusion processes. Since Walker's (1969) study of the diffusion of 88 policies across the U.S. states, research on policy diffusion has expanded in volume and scope. Nonetheless, the field is still somewhat young with a relatively small literature base. This is particularly true of studies that specifically address education policy diffusion. Most education policy diffusion research has focused on either the diffusion of charter school–school choice laws or merit scholarship programs (e.g. Cohen-Vogel, Ingle, and Spence, 2007; Mintrom and Vergari, 1998; Ness and Mistretta, 2010; Renzulli and Roscigno, 2005). McLendon and Cohen-Vogel (2008) confirm this paucity of education policy diffusion research, suggesting that there is a need for research that draws on policymaking theories from the political and policy sciences and that applies these theories to the study of education policymaking.

The diffusion research focused on education policy suggests that there are lessons from the broader policy diffusion literature that may be applied to research on education policies. Thus, this review is broad in its focus, examining studies conducted in other policy areas. Particular emphasis was placed on studies that examined vertical or vertical/horizontal diffusion and studies that examined social welfare policies (e.g. health care). Social welfare policies may

share characteristics with education policies, particularly in regard to the history of federal intervention in state policy, which has been changing over the last 20 years. Though the presence of federal influence (and, explicitly, a vertical diffusion process) may not be the focus of the research, the hope was that the selection of diffusion research in similar policy areas would increase the applicability of studies' findings to education policy research.

Finally, though the theoretical underpinning of horizontal and vertical diffusion research is the same, these lines of research are reviewed separately in part to highlight vertical diffusion studies. Race to the Top program is a federal program, thus it is important to consider the effect that the potential for federal funding may have ensured that the federal government was the primary source of information for state policymakers. That said, it is also plausible that state policymaking was entirely driven by horizontal diffusion processes; the federal government did not require specific policies, other than the aforementioned requirement that states allow the linking of student and educator data, thus suggesting that states may have looked for more specific policy ideas from other states.

2.3.1   Vertical and vertical/horizontal diffusion studies

The majority of policy diffusion research focuses on the diffusion of policies among states and ignores (or treats as a nuisance) federal action in the policy area under study. A few scholars, Karch (2006, 2007, 2010), in particular, have explicitly addressed the role the federal government may play in influencing the policy spread among the states. This section addresses the findings of research that has directly investigated vertical diffusion as well as those studies that may be more focused on horizontal diffusion but, nonetheless, address vertical diffusion effects.

Studies that focus explicitly on federal action have investigated both the effects of federal incentives on state behavior (Welch and Thompson, 1980; Savage, 1985) and the impact that more subtle forms of federal intervention (Allen, Pettus, and Haider-Markel, 2004; Karch 2006, 2010) can have on states' likelihood to adopt policies in line with the wishes of federal policymakers, while controlling for internal and external factors found to be significant influences on policymakers' behavior in the horizontal diffusion literature.

The researchers' accounting of both subtle and overt policy cues is particularly relevant for investigating the effects of the Race To The Top program because while federal actors (Congress, the President, and the Department of Education) gave states clear messages about the policies that would bolster a state's application, there was no negative incentive in the program for states that did not alter their policies and there was no absolute promise of a grant if a state were to change its policies to reflect the federal agenda. Further, RTTT's attention in each of the three policy areas examined in this study ranged from central (teacher policy) to broader and somewhat peripheral (college and career readiness policy).

The competitive grant process operates in an area somewhat between the overt incentives/disincentives that Welch and Thompson (1980) and Savage (1985) found to have positive statistically significant effects on the speed with which policies diffuse and the more subtle expressions of federal preferences investigated by Allen, Pettus, and Haider-Markel (2004), Karch (2006, 2010), and McCann, Shipan, and Volden (2010). Researchers' findings suggest that states are more likely to be influenced by the expression of federal policy preferences in federal legislation if those preferences are clear and unambiguous. In the absence of clear federal messages, however, state and policy attributes, (the actions of neighboring states, internal state characteristics, policy complexity), have a greater influence on state policy

adoption behavior. Subtle policy messages communicated through Congressional hearings or through the absence of action in a policy area receiving national attention largely fail to influence state behavior except where federal action interacts with state-level conditions that make receipt of federal messages more likely (e.g. McCann, Shipan, and Volden's [2010] finding that the professionalism of a state's legislature influences the likelihood of state action in response to the introduction of federal legislation).

A second set of studies sits between research focusing explicitly on vertical diffusion and the larger horizontal diffusion literature. These horizontal/vertical studies tend to control for federal intervention or national attention to a policy area, rather than using federal action as the independent variable(s) of interest. Broadly, these studies find similar effects as those discussed above. Interestingly, though, Daley and Gerand (2005) find that there is no effect on hazardous waste clean up policies for the amount of money a state receives from the federal Environmental Protection Agency. This finding may be a product of their measure, which encompassed all EPA funding to a state, not just the funding related to hazardous waste remediation, or it may be indicative of a lack of clear policy preference signals from the EPA.

Most of the studies discussed above employed event history analysis or a similar form of regression to investigate the effects of the focal and control independent variables on the dependent variable. As with many other diffusion studies conducted after the publication of Berry and Berry (1990), the dependent variable is constructed by coding the presence or absence of a policy in a state in a given year. Many of these studies also included a dichotomous, categorical, or count independent variable(s) to capture federal events, e.g. coding a variable for the years before federal action as 0 and the years after federal action as 1 in order to capture the effect of federal intervention or including a lagged count of the number of bills introduced in

Congress. The two studies discussed that use less statistically complex methods (Welch and Thompson, 1980; Savage, 1985) were conducted prior to Berry and Berry's (1990) proposal of event history analysis and a unified model of policy diffusion.

2.3.2 Horizontal diffusion studies

While research into the effects of vertical policy diffusion, between cities and states or between the federal government and states, is somewhat limited, far more studies have examined the diffusion of policies among states, absent any influence from federal or city policymakers. This section will focus on the research and findings from studies that have addressed horizontal diffusion. As Berry and Berry noted in 2007, since 1990 over 40 studies have been published using event history analysis to investigate horizontal policy diffusion among states in the U.S. As such, I paid to the content and impact of the studies I chose to review here; my emphasis is on formative policy diffusion studies prior to 1990 (e.g. Walker, 1969; Gray, 1973), formative or methodologically important studies published since 1990 (e.g. Berry and Berry, 1990; Volden, 2006; Boehmke, 2009), and studies that addressed the adoption of education policies (e,g. Wong and Langevin, 2007; Doyle, McLendon, and Hearn, 2010; Mohker, 2010). And, while interesting research has been conducted using data for the diffusion of "morality" policies (e.g. abortion restrictions and gay rights), I made the decision to exclude that line of investigation from this review because there is evidence that morality policymaking may be subject to a unique set of political influences that do not apply to non-morality policy areas such as education policy (Mooney and Lee, 1999).

As stated previously, the primary division in horizontal diffusion research is between studies published prior to Berry and Berry's (1990) application of event history analysis to the

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study of policy spread among states and those published after this important work. Prior to this paper, most diffusion used multiple regression analysis, a dependent variable constructed by ranking states' innovativeness, and analyzed the two influences on state-level policy diffusion processes—adoptions driven by a state's regions or neighboring states' policymaking behavior and state policymaking behavior driven primarily by internal characteristics—separately. As Berry and Berry (1990, 2007; 1994) and countless other scholars have confirmed, this approach ignores the possibility that state policy adoption is driven by a mix of internal and external factors as well as the interactions between them. Further, the reliance on OLS regression limited the form of the dependent variable, forcing researchers to make compromises that constricted research questions and hypotheses. Many of these studies relied on cross-sectional data and assumptions about states' "policy innovativeness" given their place on a chronological list of state adopters. Research since 1990 has employed increasingly more complex event history analysis models (see Buckley and Westerland, 2004; Volden, 2006, Boehmke, 2009) and, most recently, multilevel models, (e.g. Gilardi, 2010). In doing so, scholars have extended the field beyond looking for the correlates of the diffusion of a particular policy to investigate the underlying factors that influence the diffusion of a particular policy when there are policy alternatives (e.g. Volden and Cohen, 2007) and the mechanisms that drive diffusion (e.g. Shipan and Volden, 2008). Nonetheless, several of these pre-1990 studies, while somewhat limited methodologically, greatly influenced the conceptual development of the policy diffusion field. In particular, Walker (1969) and Gray (1973) developed theories of policy diffusion and conceptual reasoning for the variables that influence diffusion processes that persist in diffusion research through the present.

Across the studies reviewed, there is broad agreement about many of the internal state factors that appear to influence the likelihood that a state will adopt the policy under study. Political variables, including state government ideology and party unity across policymaking institutions, appear to influence the likelihood that states will adopt the focal policy (Walker, 1969; Gray, 1973; Berry and Berry, 1990; Renzulli and Roscingo, 2005; Volden, 2006; Volden and Cohen, 2007; Wong and Langevin, 2007; Boehmke, 2009; Doyle, McClendon, and Cohen, 2010; Mohker, 2010). Both the mean personal income for residents of a state and the state's economic health have significant, consistent effects across studies (Walker, 1969; Gray, 1973; Berry and Berry, 1990; Renzulli and Roscingo, 2005; Volden, 2006; Volden and Cohen, 2007; Wong and Langevin, 2007; Shipan and Volden, 2008; Boehmke, 2009; Doyle, McClendon, and Hearn, 2010; Mohker, 2010). Additionally, the effect of interest group strength or institutional ties to interest groups on state policymaking are largely consistent and significant in the expected directions; of the articles reviewed, only Mohker (2010) failed to find an effect for the strength of higher education in her study of the spread of P-16 councils across states (Balla, 2001; Renzulli and Roscigno, 2005; Shipan and Volden, 2008; Boehmke, 2009; Doyle, McLendon, and Hearn, 2010; Mohker, 2010).

However, researchers do not uniformly find consistent support for the influence of states' geographic proximity on the likelihood of diffusion (Walker, 1969; Berry and Berry, 1990; Balla, 2001; Boehmke, 2004; Renzulli and Roscigno, 2005; Volden and Cohen, 2007; Wong and Langevin, 2007; Shipan and Volden, 2008; Doyle, McLendon, and Hearn, 2010). There are three plausible explanations for these inconsistent findings. First, in his influential policy diffusion study, Walker (1969) found that the effect of geographic proximity on the likelihood of policy diffusion between states had begun to decline in the latter half of the twentieth century. Given

the increasing opportunities for information exchange between state officials, there are increased opportunities for policymakers to learn about policies from states with which they do not share a region or a border but do share similar demographics, ideology, or needs. Also, there is the chance that geographic proximity matters for certain types of policies but not for others. For example, while Berry and Berry (1990) found a neighbor effect on the likelihood of state adoption of a lottery, Volden (2006) did not find a similar effect on the likelihood that states would adopt similar Children's Health Insurance Program policies. In these cases, states may believe there will be a loss of potential revenue for failure to adopt a lottery when a neighboring state has done so, whereas state policymakers are not likely to feel the same competitive pressures with neighboring states when adopting health insurance assistance policies. Distinct characteristics of certain types of policies and the different pressures on state governments that these policies promote may be producing the inconsistent findings for geographic effects across studies. Finally, there is the possibility that states that share a region or a border have a socio-economically and ideologically similar population and share a similar set of policy problems; the findings of a regional effect may be the result of states' similarities, not their geographic closeness, and a problem of model misspecification.

2.4   SUMMARY

In summary, my decision to use a directed-state dyad form of the dependent variable, details of which are discussed in a subsequent chapter, is guided by prior research questions, prior research findings, and recent methodological innovations. Anecdotally, we can observe that states adopted or altered policies from March 2009 to August 2010; the directed state-dyad dependent variable

allows for the conceptually interesting investigation of whether states moved towards or away from the policies of other states during this time period and the characteristics of state pairs that appear to influence the likelihood of either outcome.

Particularly important for this research are prior findings from horizontal diffusion research of significant effects for states' political and ideological characteristics and the influence of issue interest groups in influencing states' policymaking behavior and likelihood of policy adoption. For example, political and ideological considerations appear to have influenced states' decisions to apply for RTTT grants; Texas and Alaska declined to participate in RTTT, citing opposition to federal influence and federal spending (Dillon, 2010). Additionally, the program perceived as pushing reforms typically associated with Republicans (e.g. tenure reform and stringent teacher evaluation) was designed by a Democratic administration. The effect of this may have pulled both Democratic and Republican state governments in interesting ways and impacted the influence of state teachers' unions. Democratic state governments may have been caught between the perceived preferences of a newly elected Democratic president and their traditional alliances with teachers' unions. Republican state governments may have struggled with their preference for the Obama administration's policies and their political base's animosity towards the president. Political party governance, teachers' union strength, and state ideology may have been important factors in the "spread" of education policy during the RTTT competition.

Further, while somewhat less developed than the literature on horizontal diffusion processes, prior vertical diffusion research suggests that the effects of RTTT on state policymaking behavior may be different among teacher policy, college and career readiness policy, and persistently lowest achieving schools. Each area was associated with different levels

of attention and specificity from the federal government and organizations outside of government.

In light of the findings of prior research discussed in this chapter, Chapter 3 will set forth the methods, hypotheses, and variables selected for the analysis of RTTT-related, state-level policy change.

3 METHODS

The above literature review suggests fruitful avenues for policy diffusion research and, in particular, for the analysis of horizontal and vertical diffusion processes in the context of the competitive process used to award states RTTT funds. While prior studies have largely relied on event history analyses to examine diffusion processes, the necessity of simultaneously modeling horizontal diffusion and federal diffusion pressures during the RTTT competition suggests the use of a model that can both account for the dependencies inherent in state dyads observed multiple times and track the variation in state policymaking as a result of federal pressures. The piecewise linear growth model used for this analysis was chosen in order to address these needs. While this method of analysis is not common in the diffusion literature, a few recent studies have begun to employ multilevel methods of modeling diffusion processes (e.g. Gilardi, 2010), and my decisions about the independent variables and the form of the dependent variable, a measure of policy distance between directed state dyads, were informed by and grounded in the evolving methodological approaches used in diffusion analyses over the last 45 years.

This chapter will first explore the methods employed and independent variables included in past diffusion studies, with particular attention paid to the theoretical and empirical reasons for the inclusion of control and focal variables and to the form and construction of the dependent variable in diffusion studies. I will then return to the study's research questions, discuss the construction of the dependent variable for this analysis, detail data used for the control and focal

independent variables, and discuss corresponding hypotheses. The chapter will conclude with a description of the final estimated models and an explanation of the interpretation of specific variable coefficients, a check of model assumptions, and a discussion of the limitations of this study.

3.1   TESTING DIFFUSION: METHODS USED IN THE ANALYSIS OF POLICY DIFFUSION

The diffusion research literature is divided into two clearly delineated methodological periods, a testament to the impact that Berry and Berry's (1990) unified model of diffusion and use of event history analysis has had on research in the field. Early diffusion research employed cross-sectional or time-series regressions and factor analysis to investigate internal determinants and national or regional diffusion, respectively. The distinction between the methods used to investigate internal determinants and geographic diffusion patterns is important because it highlights the separation of internal factors and from geographic factors in these analyses. The following sections will discuss the best known of the early studies of diffusion, Berry and Berry (1990)'s event history analysis, and additional specifications of diffusion and innovation analysis models that subsequent researchers have proposed and tested.

3.1.1   Early diffusion and innovation studies: Walker (1969) and Gray (1973)

Two prominent early diffusion studies, Gray (1973) and Walker (1969) employ linear regression approaches, constructing dependent variables to capture states' innovativeness and including

variables thought to be related to states' propensity to adopt new policies. Walker (1969) tests states' internal characteristics by constructing an innovativeness score for each state. For 88 policies, he counts the number of years between the first and last adoption and uses that to give each state a score corresponding to the percentage of the total diffusion time that had elapsed prior to the state's adoption. (The last state to adopt a policy and states that had not adopted the policy were given a score of 1.000.) The innovation score is calculated by subtracting the average of this number for all issue areas from 1.000; he states, "The larger the innovation score, therefore, the faster the state has been, on the average, in responding to new ideas or policies" (p.883). He then tests the correlation of states' innovation scores with economic, demographic and political factors that prior research suggested would be related to innovation, including state government and individual economic well-being, percent of the population illiterate, percent of the population residing in urban areas, party competition for state offices, and legislative professionalism.

In a separate analysis, Walker (1969) conducts a factor analysis based on states' innovation scores to group states into regions for the analysis of regional diffusion effects. Gray (1973), in her study of three policy areas, conducts two distinct analyses to understand the role of diffusion and innovation on state policymaking in each area. She builds a regression model to understand diffusion as a function of the proportion of states that had adopted a policy and the interaction between adopting states and those that had not adopted the policy. To quantify innovation she ranks the order in which states adopted policies and uses Spearman rank order correlations to understand the stability of rank order as a measure of innovativeness within each issue area.

These methodological approaches were problematic because the researchers separated the analyses of internal characteristics and geographic diffusion; this separation rested on the assumption either that states are not influenced by external factors such as other states' policy decisions or that a state's internal characteristics (e.g. demographics, ideology, economic status) had no bearing on its decision as to whether to adopt a policy. Subsequent researchers have demonstrated the hazard of analyzing internal determinants and geographic diffusion effects in isolation (see Berry, 1994; Mooney, 2001). Berry and Berry (1997, 2007) argue that internal determinants models often include independent variables intended to capture state characteristics measured at a single time point for a process that, in many cases, spans many years, ignoring both the changes in state characteristics and the differential impact of state characteristics on the policymaking process over time. Tests for geographic diffusion are similarly biased. Berry and Berry (1997, 2007) report that for any policy adoption process that follows the expected curve of cumulative adoptions, results will support both national and regional diffusion though the pattern may be better explained by state internal characteristics and changes in these characteristics over the course of the adoption period under investigation.

Nonetheless, while these earlier works may have had methodological flaws that limit the usefulness of their findings, they made significant conceptual contributions, particularly in highlighting the work of innovation and diffusion scholars in other fields and for political scholars and adapting and applying that work to empirical tests of policy adoption patterns.

3.1.2   Event history analysis: Berry and Berry (1990)

As mentioned above, Berry and Berry (1990) added a significant analytical tool to the investigation of policy diffusion across governments with their introduction of a unified

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conceptual and analytical model of policy diffusion and innovation. They explain that the dependent variable in the event history analysis method they employ is the hazard rate, the probability that an individual (or policymaking entity) who is at risk of experiencing the event will do so during a particular time period. To illustrate in a typical policy diffusion study context, if the time unit were a year, the hazard rate would be the probability that a state that had not yet adopted a policy would do so during a given year. As Berry and Berry (1990) state, hazard rate is an unobserved variable. In the event history analysis method they propose, the dependent variable used for estimating effects is coded 1 in the time period that the individual (state) experiences the event (policy adoption) and is coded 0 otherwise. If the event can only be experienced once, as would most likely be the case with the adoption of a specific policy such as in the example above, the individual is no longer included in the risk set in time periods subsequent to that in which they experienced the event. In their analysis, Berry and Berry (1990) use a discrete time model, but event history analysis can be used to analyze continuous events and repeated events.

In a data set constructed for a discrete time event history analysis, each case would include the dummy coded dependent variable, the observation of the adoption/non-adoption event for the state in a given time period, and independent variables to capture the internal determinants of innovation and the effects of geographic diffusion. This model jointly analyzes the effects of state characteristics and the impact of neighbor, regional, or national adoptions on the state's adoption of a particular policy and allows for the variables that represent internal and external influences to vary over time (Berry and Berry, 1990). Thus, the event history analysis model addresses the two criticisms of the separate models discussed earlier. Each case captures the characteristics of the state in that particular year and does not assume that these

characteristics are fixed over time, and the inclusion of variables representing geographic diffusion in a model with state characteristics decreases the likelihood of finding a misleading significant neighbor or regional diffusion effect (Berry and Berry, 1990; Berry, 1994).

Coefficient estimates of the independent variables in this model offer "information on the predicted impacts of these variables on the propensity of states in the risk set to adopt the policy" (Berry and Berry, 1997, 2003, p. 243). These estimates can be used to understand the effect of specific variables (e.g. state financial resources, mean educational attainment for the state's residents, state ideology) on the state's likelihood to adopt the focal policy, controlling for the other variables in the model, and can also offer researchers "predications of the probability that a state with any specified combination of values on the independent variables will adopt the policy in a given year" (Berry and Berry, 1997, 2003, p. 244). This predictive information about the probabilities of internal and external effects on the likelihood of policy adoption can be more useful than information about the correlations of isolated characteristics with past adoption events, as was the case with earlier investigative methods.

In addition to their methodological contribution, Berry and Berry (1990, 1997, 2007) encapsulated prior diffusion and innovation research (e.g. Mohr, 1969; Rogers, 1962, 2003) in the general form of their model:

$$ADOPT_{i,t} = f \quad (MOTIVATION_{i,t}, \quad RESOURCES/OBSTACLES_{i,t}, \quad OTHER$$
$$POLICIES_{i,t}, EXTERNAL_{i,t})$$

$MOTIVATION_{i,t}$ encompasses independent variables for the motivation that state policymakers have for adopting a new policy or remaining with the status quo. Motivation factors could include the severity of the policy-related problem in the state, demographic or

social characteristics of the state that would encourage or discourage the passage of a policy, and ideological factors or public opinion. *RESOURCES/OBSTACLES$_{i,t}$* captures the conditions in the state related to capacity or lack of capacity to adopt a new policy, such as the state's budgetary status, legislative resources and opportunity to learn of policy solutions (commonly referred to as legislative professionalism), and religiosity or educational attainment of the state's population. Adopting the work of Mahajan and Peterson (1985) modeling innovation diffusion, Berry and Berry (1990) include the *OTHER POLICIES$_{i,t}$* set of variables to account for the effect of prior policy enactments which could supersede or enable future policy adoptions in an issue area. Finally, *EXTERNAL$_{i,t}$* represents external diffusion pressures as a result of geographic proximity or national interaction with previously adopting states. This broad framework has been refined by subsequent researchers to capture the effects of significant policy-relevant events, of the distribution of populations in a state, of interest group strength, of policy entrepreneurs, and of policymakers' ties to professional networks on the likelihood of states' policy adoption.

3.1.3   Extensions of Berry and Berry's (1990) event history analysis model

Many of the specifications and alternative models have been proposed by researchers following Berry and Berry (1990) in order to understand the role of specific policy characteristics or to model more complex policies and diffusion processes. This work has underscored the importance of considering all of the methodological strategies available to investigate diffusion, e.g. logistic regression, event count models (Boehmke and Witmer, 2004), directed dyad event history models (Volden, 2006; Gilardi and Füglister, 2008), Cox repeated event models (Jones and Branton, 2005), multilevel models (Gilardi and Füglister, 2008, Gilardi, 2010) and the possibilities for constructing independent variables to capture motivation, resources and

obstacles, and external pressures across multiple contexts and policy areas. This section will review some of those specifications, modifications, and alternative models, focusing on those most relevant to the study of state education policy changes during the Race to the Top (RTTT) application period.

3.1.3.1   Alternative forms of the EHA model

The general event history analysis model with modifications allows for more complex specifications of the dependent variable than Berry and Berry (1990) specified, which Jones and Branton (2005), citing Beck, Katz, and Tucker (1998), describe as binary time-series cross-sections (BTSCS), reflecting the construction of the dependent variable as binary (adopt or not adopt) for the years of the diffusion period. Many researchers, as Jones and Branton (2005) note, have, due to the binary form of the dependent variable and the interpretation of it as the probability that a state will adopt a policy during a given time period, used logit or probit models. These specifications, however, assume a distributional shape of the hazard rate and, specifically, that over time the probability of a state adopting a policy remains the same. Jones and Branton (2005) analyze and compare models that include time and time transformation variables in the model in order to demonstrate the importance of the time specification, an approach that Gilardi and Füglister (2008) and Box-Steffensmeier and Jones (2004) also suggest. They propose the use of the Cox duration model, asserting that it does not have an assumption about the distributional form of the baseline hazard rate, and that it can be employed for research questions that involve the adoption of multiple components as well as for research into policy areas where there may be repeated adoption events within a single state (Jones and Branton, 2005). Other researchers have suggested adding independent variables to count the number of previous adoptions if the assumption that the odds of an event occurring increase proportionally

with each additional occurrence holds (Beck, Katz and Tucker, 1998, cited in Gilardi and Füglister, 2008; Box-Steffensmeier and Jones, 2004).

These adjustments have been introduced to address problems with the Berry and Berry model that emerged as researchers sought to investigate more complex diffusion processes. Nonetheless, these extensions to Berry and Berry's model have remained somewhat constrained by the research questions and policy areas the model was proposed to investigate—a single policy adoption event in a policy area dominated by state level processes (e.g. passage of lottery or state tax). The questions proposed in this dissertation necessitate modeling repeated changes to policy components, not just a single policy change, and the simultaneous investigation of federal and state diffusion pressures and the impact of changes in states' knowledge of federal preferences on their policymaking behavior. The directed dyad form of the dependent variable proposed by Volden (2006), discussed below, can address some of these requirements through a dependent variable that measures states' changes to policy components within broader policy areas.

3.1.3.2   Directed dyad form of the dependent variable in diffusion studies.

In addition to modifications to allow for modeling multiple or repeated events, the general event history analysis model Berry and Berry proposed has been adapted to allow for the inclusion of information about the direction of policy adoptions in cases where the research question suggests the need to understand which policy diffused or the state from which another state "borrowed" a policy. Volden (2006) used directed dyad event history analysis to investigate whether states are more likely to emulate the "successful" Children's Health Insurance Program policies found in other states, employing a directed dyad approach drawn from international relations literature. The directed dyad dependent variable in diffusion studies, as explained by Volden (2006) and

Gilardi and Füglister (2008), allows for the researcher to look at a pair of governments during the time period of interest, rather than a single government, and to determine whether the first state had "emulated" the second state, capturing the movement toward or away from a particular type of policy or a particular state's policy. For policy passed during the first two rounds of RTTT, the directed state dyad dependent variable enables measurement of multiple state education policy changes on a number of policy indicators. For example, the directionality of the dependent variable enables the exploration of whether states were more likely to adopt policies similar to the first round winners' policies through the inclusion of an independent variable indicating whether the first round winners, Tennessee and Delaware, were the second state in the dyad.

As Gilardi and Füglister (2008) explain, "the goal is then to detect systemic patterns in increased similarities and to estimate the influence of various factors on the decisions of states to introduce policy changes that move them closer to other states" (p. 419). The directed structure of the dependent variable can take on more complex forms, rather than indicating the single adoption event of one policy, as Volden (2006) demonstrated, with the dependent variable reflecting multiple policy components and distances between states with respect to those components[9] and, if data is available, relatively short time units. For the research questions this study proposes, the ability to measure changes to policy components and to understand whether states were moving their policies towards states with which they shared characteristics or to align with perceived federal preferences is more critical than knowing simply whether a state passed a particular policy. For example, knowing that a state passed a teacher evaluation policy is less interesting than knowing whether the evaluation policy passed had requirements similar to those

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[9] For a more detailed description of Volden's (2006) coding rules and analysis, see Volden (2006) p. 300 and Gilardi and Füglister (2008) p. 421.

in policies enacted previously in states with right to work laws and, thus, politically weaker teachers' unions.

The final part of this section exploring methods used to investigate policy diffusion processes will detail independent variables identified by prior diffusion research to capture state characteristics and external influences on state policymaking. This prior research informed the selection and construction of the independent variables included in the final models for this investigation.

3.1.3.3   Independent variables.

Berry and Berry's (1990) initial model included independent variables integrating Mohr's (1969) and Roger's (1962, 2003) theories of innovation diffusion; motivation to adopt, resources and obstacles to adoption, other policies that could impact the adoption event, and external diffusion effects were included through variables measuring, for example, state economic health, state population, state ideology (using Berry et al.'s [1998, 2010] measure of state ideology), and the proportion of neighboring states that had adopted the policy. Many of these variables that researchers consistently include in diffusion analyses incorporate the same state characteristics indicators that Walker (1996) investigated.

The inclusion of additional independent variables has extended the model to capture more complex or policy area specific diffusion processes. Mintrom and Vergari (1998) included measurements of the presence of a policy entrepreneur and of the extent to which state policy entrepreneurs engaged with internal and external policy networks in order to investigate the role of policy entrepreneurs and policy networks in the introduction and adoption of charter school legislation. Similarly, Balla (2001) included variables to account for interest groups' strength and for the extent state officials' participation in a policy relevant national professional organization

in order to understand the influence these national organizations on passage of HMO regulatory legislation. Other researchers investigating policy diffusion across states have added state education governance and leadership (Moehker, 2010); amount of spending on education (Wong and Langevin, 2007); Congressional attention variables represented by a count of hearing days in a policy area (McCann, Shipan, and Volden, 2010); dummy variables indicating passage of legislation (Allen, Pettus, and Haider-Markel, 2004); and national media attention as a count variable representing the number of national news stories focusing on a policy area (Grossback, Nicholson-Crotty, and Peterson, 2004).

Diffusion researchers have also added independent variables to test hypotheses about specific diffusion trajectories. For example, Mooney (2001) attempts to clarify regional diffusion effects by adding dummy or count variables representing time in addition to variables to capture the number of neighbors of the focal state that had adopted the policy and a quadratic term, allowing for curvilinear effects. He finds that the inclusion of the quadratic term captures the effect of neighbor adoptions as it changes over time, exerting a positive influence early in the diffusion period that decreases over time as more states adopt the policy. Similarly, researchers have constructed independent variables in attempts to capture learning processes and the increasing weight that some state characteristics may have over time (Berry and Berry, 1997, 2007; Gilardi and Füglister, 2008). Regardless, Berry and Berry's (1990) conceptual and theoretical model, if not their particular specification of EHA, has persisted in part due to its flexibility in accommodating an array of research questions and foci across policy areas. And while this research uses a hierarchical piecewise growth model rather than an event history analysis, it is grounded in the theory of state policy diffusion Berry and Berry (1997, 2007) illuminated.

3.2   PROPOSED ANALYSIS: INVESTIGATING RTTT STATE-LEVEL POLICYMAKING

3.2.1   Piecewise linear growth model for RTTT analysis

As previously stated, the proposed analysis will employ a piecewise linear growth model using a directed state dyad dependent variable measuring state policy distance. This method was chosen because it allows for the investigation of the diffusion of multiple policies, can address nuanced questions about the spread of policy components, and can model changes in state policymaking trajectories before and after the release of final federal program guidance and the announcement of Round 1 winners. In order to address my research questions, I attempt to detect systemic patterns in the likelihood of states to adopt policies similar to those of other states or to change their policy making behavior in response to federal actions in three policy areas: teacher policy (e.g. evaluation, retention, compensation and licensing policies); college and career readiness policy (e.g. the alignment between high school assessments and post-secondary requirements, reporting between secondary and post-secondary institutions); and persistently lowest achieving schools policy (e.g. school turnaround models, state powers to take over poorly performing schools).

The piecewise linear growth model was chosen over the event history analysis model for two primary substantive reasons. First, the multilevel model can address the dependencies inherent in the dyadic form of the dependent variable. Specifically, states appear in dyads at the same time point representing both policy "sending" states, also referred to as the B state in a dyad, and policy adopting or "receiving" states, or the A state in a dyad. Further, the same dyads are observed at multiple points during the 18-month period. By nesting time points (level 1) in dyads (level 2) I seek to address these dependencies.

Secondly, the research questions necessitate comparing changes in states' policymaking trajectories before and after the release of federal program guidance, in November 2009. In the first time period in this analysis, prior to the release of final guidance, considerable discussion in the education press focused on the importance of charter school legislation. When the final guidance and scoring rubric were released, states learned that they would be judged on both their charter school law and the their state's "innovative" district schools and that states could earn partial points even if they retained caps on charter schools or did not equalize funding for charter schools. The emphasis on teacher and school leader policy increased in the final program guidance, however. The change in information available to states about federal policy emphasis and preferences, and the potential for that change to impact the pace and focus of state policymaking, suggests the use of the piecewise linear growth model to understand changes in state policymaking overall and differences in the impacts of independent variables in each time period.

In a directed dyad event history analysis, the dependent variable is usually dichotomous and is constructed to capture increased similarity in state policies, not a singular observable adoption event or, more specifically, the likelihood of state A's policy in time t moving toward

state B's policy in time *t-1*. I have adapted this to capture more subtle changes in state policies than can be expressed through a dichotomous variable, using a continuous policy distance measure. (The procedure I used to construct dependent variables for each of the three policy areas is discussed in detail below.) Though this allows for the detection of smaller policy movements, reflecting the multiple changes states made to policies during the 18 month span of the first two rounds of the RTTT competition, the dependent variable is still understood to be a function of independent variables capturing state characteristics, geographic proximity, and internal and external influences, in line with prior diffusion studies.

I will now return to the research questions put forth in Chapter 1 and, given the above, discuss the data for this analysis, describe the procedure for the construction of the dependent variable, and detail the control and focal variables to be included in the models for each policy area and corresponding hypotheses.

3.2.2 Research Questions

1. Is there evidence that states adopted policy ideas from other states? (horizontal diffusion)

    a. Did states look to states with which they shared demographic, political, or economic characteristics?

    b. Did states adopt policies similar to those in states perceived to be favorites to win the competition (i.e. states initially selected to receive Gates application assistance)?

    c. Did states that did not win Round 1, but who applied to round 2, adopt policies similar to those in Tennessee and Delaware in the second time period,

after the release of federal guidance and, in part, after their announcement as Round 1 winners?

2. Did state policymaking change in response to significant federal actions (i.e. the release of final program guidance in November 2009)? (vertical diffusion)

3. Were there differences in state diffusion patterns across the three policy areas included in this study (teacher and school leader policy, college and career readiness policy, lowest-performing schools policy)?

    a. Among policy areas, were there differences in the policymaking trajectories and influences of independent variables in each time period?

3.2.3   State selection

Across RTTT rounds 1 and 2, 46 states and Washington DC applied for funds; only Alaska, North Dakota, Texas and Vermont chose not to apply for funds in either round. (A full list of the states, the round(s) in which they applied, their final rank, and grant award status are listed in the Appendix). I chose to include all states, with the exception of Hawaii. Excluding Hawaii from a diffusion analysis is common because policy diffusion theory suggests that the proportion of a state's neighbors who have previously adopted the policy can influence a policy adoption decisions. Though geographic proximity is not expected to have played an important role in education policy adoptions in the three policy areas, the precedent for excluding Hawaii suggests it not be included. Additionally, the education governance system in Hawaii is unique; the entire state is one school district, which suggests that education policy adoption processes may be fundamentally different from other states' processes. Additionally, Washington DC was

excluded from the analysis. Washington is both a city and has a governance system that is distinct not only from states, but also from other cities. The District of Columbia is under the jurisdiction of the U.S. Congress, which has assigned governance for the schools to the city's mayor. Given the unique contexts and governance structures in Hawaii and Washington, DC, they were excluded from the analysis, leaving 45 states as potential adopters or adoptees.

3.2.4   Policy areas selection

The four assurance areas for RTTT, established in ARRA, guided the selection of three policy areas in which to examine state policy diffusion–college and career readiness, teacher and school leader, and persistently lowest-achieving schools policy.

Table 1. RTTT assurance/policy areas

Adopting standards and assessments that prepare students to succeed in college and the workplace to compete in the global economy;	College and Career Readiness
Building data systems that measure student growth and success, and inform teachers and principals about how they can improve instruction;	State Longitudinal Data Systems
Recruiting, developing, rewarding, and retaining effective teachers and principals, especially where they are needed most;	Teacher and School Leaders
Turning around our lowest-achieving schools	Lowest-performing schools

(American Reinvestment and Recovery Act, 2009)

Of these four areas, I chose to investigate all but the second, state longitudinal data systems, because that area had the most restrictive federal criteria, and the data-related issues for which the states had the most latitude (e.g. the use of student performance data for decisions about professional development or teacher evaluation) could be captured within the other three areas. A review of state applications confirms this; states discussed the use of data extensively outside of the data section of their applications. Additionally, the selection of these three areas offers the opportunity to compare policy areas in which state policy had been subject to varying levels of attention from other federal programs or outside groups. RTTT was somewhat unique in its focus on state teacher policy related to compensation, tenure, and evaluation, as most previous attention had been focused on district teacher policy. States' college and career readiness policies had received significant attention from groups such as Achieve and states' persistently lowest achieving schools policies had been the subject of another federal grant program (School Improvement Grants) also funded by the American Reinvestment and Recovery Act.

3.2.5 Time periods for analysis

Over the course of the first two rounds of RTTT, there were five significant federal actions: the passage of ARRA (February 2009); the release of draft federal program guidance (July 2009); the release of final federal program guidance (November 2009); the announcement of RTTT Round 1 grantees (March 2010); and the announcement of RTTT Round 2 grantees (August 2010). State policy changes were recorded at each of these five time points and during the model

building process I determined that dividing the analysis into two time frames, from March 2009[10] to November 2009 and from December 2009 to August 2010, best fit the data in addition to serving as the best conceptual match for the research questions.

3.2.6   Dependent variable data collection and construction

As discussed earlier in this chapter, the directed state dyad form of the dependent variable is most appropriate for the analysis of diffusion patterns of policies or policy areas with multiple components and is better suited to address the research questions in this analysis than a non-dyadic indicator variable. In his analysis of state changes to Children's Health Insurance Program (CHIP) policies, Volden (2006) used the Centers for Medicare and Medicaid Services website to construct a dataset of state polices on 6 CHIP characteristics states were likely to have modified in the years following program initiation. There was no comparable education dataset with indicators of state policy change available for the time periods required for this analysis. However, the *Education Week EdCounts* policy indicators available through the *Editorial Projects in Education* website (http://www.edweek.org/rc/2007/06/07/edcounts.html?intc=thed) provided a baseline measure of state policies and indicators that could be used to construct a dataset similar to Volden's using state legislation and policy documents found on states education departments, legislatures, and secretaries of states websites. Of the 250 indicators available in the *EdCounts* database, 52 were selected based on their relevance to the three policy areas selected for this investigation. (The use of *Education Week's* indicators in education

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[10] The month lag is to allow time for state legislatures time to respond to ARRA.

research is not without precedent–see, for example, Desimone, Smith, Hayes, and Frisvold, 2005). These indicators are listed in the Appendix.

Following a process informed by Volden (2006), Gilardi and Füglister (2008), Boehmke (2009) and Gilardi (2010), the dependent variable was constructed in the following steps:

1.   Using the Education Commission of the States' State Policy Database, states' legislatures' and all state policies during the time period of interest were cataloged and full text of legislation and administrative policies were downloaded from legislatures' websites or secretaries of states' registers (1485 documents).

2.   Bills and Policies were coded on indicators used by *Education Week's Ed Counts* database to characterize state policies. (College and Career Readiness – 13 indicators, Teacher policy – 25 indicators, Persistently Lowest Achieving Schools – 13 indicators). The codes were both dichotomous (e.g. "State passed PD standards") and continuous (e.g. "Years state pays for induction/mentoring). (A full list of these indicators can be found in the Appendix.)

3.   Dates on which bills were signed into law or policies were adopted were used to place passage/adoption in one of 4 time periods.

4.   Each state's status on each indicator was aggregated at each time point, based on the policies adopted or bills enacted since the previous time point. For example, if at Time 1 a state did not have professional development (PD) standards, the indicator for that state at that time point would be coded 0. If between Time 1 and Time 2 a state passed statewide PD standards, the indicator for that state at Time 2 would be coded as 1, recording the policy change on that indicator between the two time points. This procedure

resulted in a file with cases for each state's status on each policy indicator at each time point. (45 states with 5 time points for each state, or 225 cases).

5. In order to calculate the dyadic dependent variable, the Euclidean distance between each state's policies in each time point to every other state's policies in the prior time point was calculated using SPSS. As the dependent variable is directed, each state could be both a policy adopting, or receiving, state or a state from which a policy or policy component could be adopted. (For example, the comparison of State A to State B would yield the following over all time points: [Distance Time 0 (baseline): $A_{t0} \rightarrow B_{t0}$, $B_{t0} \rightarrow A_{t0}$], [Distance Time 1: $A_{t1} \rightarrow B_{t0}$, $B_{t1} \rightarrow A_{t0}$], [Distance Time 2: $A_{t2} \rightarrow B_{t1}$, $B_{t2} \rightarrow A_{t1}$], [Distance Time 3: $A_{t3} \rightarrow B_{t2}$, $B_{t3} \rightarrow A_{t2}$], [Distance Time 4: $A_{t4} \rightarrow B_{t3}$, $B_{t4} \rightarrow A_{t3}$.]) (Distance between 45 states and all other states at each time point, 9900 observations).

6. Cases representing time points when State A in the dyad had not adopted any new policies since the prior time point were dropped from the data set. Dropping these observations ensured that states were included as potential adopting states only when they were "at risk" of adopting from another state[11]. To use North Carolina and New York as examples, if, between Time 1 and Time 2, NC changed its policies and NY did not, the observation for $NC_{t2} \rightarrow NY_{t1}$ would remain in the dataset, the observation for $NY_{t2} \rightarrow NC_{t1}$ would not, because at Time 2, having made no policy changes, NY was not "at risk" for adopting a policy or policy component from any other state. (College and Career

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[11] This approach to account for time periods when states had made no policy changes is adopted from Boehmke (2009).

Readiness Policy – 3,948 observations, Teacher Policy – 5,100 observations, Persistently

Lowest Achieving Schools – 3,446 observations)[12].

As Volden (2006), Gilardi and Füglister (2008) and others have discussed, there are

multiple ways to proceed in order to calculate the distance between state-dyads for each time

period in order to code the dependent variable. Volden (2006) compared the results from two

methods of calculating the distance between state pairs (absolute number of changes toward state

B of the dyad and, in order to account for dependence among indicators, a factor analysis of the

indicators followed by a calculation of the Euclidean distance between states) and found little

difference in the coefficients for independent variables.

3.3   RESEARCH HYPOTHESES AND INDEPENDENT VARIABLES

In order to address the research questions posed above and with consideration of the findings of

past diffusion research, as discussed in Chapter 2, this section will propose research hypotheses

and discuss the independent variables included in the final model. Where not otherwise

indicated, it should be assumed that predicted directions of coefficients and hypotheses apply

across the three policy areas.

> Research Question 1a. Did states look to states with which they shared demographic,
>
> economic, or political characteristics?

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[12] Idaho, Kansas, Montana, Pennsylvania, South Carolina, Virginia, and Wyoming made no changes to their policies on any of the indicators across any time periods, thus they are included in the analysis as states from which other states could potentially adopt, but not as potential adopters.

3.3.1 State demographic characteristics variables and hypothesis

Prior diffusion research has identified a number of state characteristics that may impact the likelihood of states to adopt policies from one another, and I include these variables in the model both as controls and, more substantively, to understand whether the effect of these characteristics changed over the course of the competition. The first set of these variables tests the demographic similarity of the states in the dyad or the effect of either State A's characteristics or State B's characteristics. *State population ratio* was constructed to measure the comparative populations of two states in a dyad by taking the ratio of the population of the larger state in the dyad to the population of the smaller state in the dyad. If states were adopting policies from similarly sized states, the coefficient for this variable should be negative. *Difference in diploma rate* captures the difference between the two states in the rate of high school completion for adults over the age of 25. If states were adopting policies from states with different rates of high school completion, we would expect this coefficient to be positive.

> *H1a: State demographic characteristics hypothesis*: If state policymaking proceeded during RTTT in predictable ways, states will be more likely to adopt policies similar to those in states with similar populations and to adopt policies from states with higher high school diploma rates. The effect of following states with higher diploma rates should be most pronounced in College and Career Readiness policy where high diploma rates would serve as a marker of successful policy.

3.3.2 State economic characteristics variables and hypothesis

In order to capture the effect of the relative wealth of the two states' populations and the general economic health of the state in 2009 and 2010, I include *Difference in states' per capita income* and *Change in general revenue from prior year in State A*. If states were adopting from states whose populations had similar incomes, we would expect the coefficient for difference in income to be negative. I expect a positive coefficient for the variable measuring the increase or relative stability of the adopting state's general revenue; states with more stable revenues or greater increases in revenues, particularly given the state of the national economy at the start of 2009, may have been less likely to move in the direction of other less economically healthy states. Further, these states may have been less likely to change their laws quickly in pursuit of the relatively small RTTT grants.

> *H1b: State economic characteristics hypotheses*: States will be more likely to adopt policies from states with which they share economic characteristics across both time periods.

3.3.3 State political characteristics and ideology variables and hypotheses

Particularly given the politically sensitive nature of teacher evaluation policies, ideological and political variables may have influenced states' policy decisions over the course of the competition and may have done so in unexpected ways. While RTTT was created and administered by a Democratic Obama administration, and was funded by with the contentious ARRA, the teacher policies associated with RTTT had found favor across traditional ideological

lines. In order to capture these phenomena, I include *Difference in state ideology* and *Unified Republican government, Unified Democratic government*. *Difference in state ideology* is the absolute difference in states' ideology scores using Berry et al's (2010) measure of state ideology, which assigns each state a score on a 0 (more conservative) to 100 (more liberal) scale based on a number of factors including the voting record of the state's Congressional delegation and the election margins of Congressional and statewide candidates. Prior diffusion research finds that the more distance between states' ideology, the less likely they will be to adopt similar policies. This suggests that the coefficient for this variable should be positive–as the distance between states' ideologies increases, the distance between their policies should also increase; however, this prediction may not hold in the context of teacher policies, generally, and RTTT, specifically. The *Unified Republican government* and *Unified Democratic government* dummy variables capture whether or not the governors' offices and both houses of state legislatures across both states were held by Republicans or Democrats, respectively. Based on prior research we would expect that if governors' offices and legislatures across both states in the dyad were held by the same party, policies would be more likely to diffuse between them, and we would expect that the coefficients of these variables would be negative. Particularly in state dyads held by Democrats, there is reason to expect that this prior relationship may not hold; Democratic governors and legislatures were, in some respects, pulled in two directions by RTTT. While the program was associated with a Democratic president and some prominent Democrats were proponents of dramatic reforms to teacher evaluation and tenure policies, these reforms were largely opposed by teachers' unions, which are traditional Democratic allies and political supporters. These politically complicated relationships were not limited to Democratic officeholders, though. In Florida, for example, Governor Charlie Crist, facing defeat by a strong

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challenger from his ideological right in the Republican primary for U.S. Senate, chose to veto teacher evaluation legislation–a move which won him support from the state's teachers union and their allies for his run as an independent in the Senate generally election.

Finally, I include indicator variables for the process through which the potential adopter state (State A in the dyad) selects the Chief State School Officer (CSSO). States select their CSSO through statewide elections (14 states), appointment by the governor (10 states), or appointment by the State Board of Education (24 states). (See Appendix E for a full list of states and selection processes.) I expect that states with elected CSSOs will be less likely to make policy changes towards other states in the politically contentious policy areas, i.e. teacher and persistently lowest achieving schools policy, particularly during the second timeframe, yielding a negative coefficient in Time 2.

> *H1c: Same party hypothesis:* States will be more likely to adopt policies from
> governments with which they share a political party in the first time period. In the second
> time frame, Democratic governments will be less likely to emulate other democratic
> governments, particularly in the teacher policy area.

> *H1d: Government ideology hypothesis:* There is evidence (e.g. Dillon, 2010) that usual
> ideological lines were crossed in the pursuit of new teacher evaluation and low
> performing schools policies, and states will be more likely to emulate policies similar to
> those in ideologically similar states in time 1 but less likely to emulate states with similar
> ideologies in Time 2 in those two policy areas. I do not expect ideology to have a
> significant effect on college and career readiness policy.

H1e: Chief State School Officer hypothesis: Elected CSSOs will be less likely to move towards the policies in states with appointed CSSOs, particularly in Time 2 in the teacher and persistently lowest achieving schools policy areas.

3.3.4 Education and interest group strength variables

The complicated political relationships and influence of teachers' unions on political processes necessitates the inclusion of variables to measure unions' relative strength, *Teachers' Union political contributions (State A)* and *Right to work state (State B). Teachers' Union political contributions* in the adopting state is calculated for each year by dividing the year's political contributions from teachers and teachers unions within each state, as tallied by the Center for Responsive Politics, by the total number of K-12 students in the state in order to standardize the measure across states. We would expect that as teachers unions contributions increase, the state would move further away from the general trend towards more prescriptive policies for teacher evaluation, placement and retention decisions if RTTT-related policymaking followed previously identified diffusion patterns. The second variable, *Right to work state*, indicates the status of the dyad's policy sending state's right-to-work laws; states without strong teachers' unions may have passed more prescriptive laws earlier than states with stronger union protections and, thus, may have been more likely to be emulated by other states, yielding a negative coefficient.

Further, I include a proxy for the relationship between state and local education policy authorities, *Percent of local school funds from the state (State A)*. States where more education funding originates in state government may have been more likely to adopt policies similar to those in other states following the general trend towards convergence around a common set of

policies governing teachers, yielding a negative coefficient. States with greater influence over districts may have been better politically positioned to pass these policies.

> *H1f: Teachers' union strength hypothesis*: I expect the effect of teachers' union strength, as measured by union contributions to political campaigns and lobbying efforts, to be strongest in the teacher policy area; states with teachers unions making greater contributions will be less likely to emulate the policies of other states.

> *H1g: Right to work hypothesis*: States with right to work laws will be more likely to be emulated by other states, particularly in teacher policy in the second time period.

> *H1h: Local control proxy hypothesis:* States where a greater percent of local education spending is funded by the state will be more likely to adopt policies similar to those in other states in teacher policy and lowest achieving schools policy. I do not expect an effect in college and career readiness policy.

> Research Question 1b: Did states adopt policies similar to those in states perceived to be favorites to win the competition?

3.3.5   "Leader" states variables and hypotheses

In July 2009, the Bill and Melinda Gates Foundation offered 15 states grants and technical assistance in order to support their applications for RTTT grants (Bill and Melinda Gates Foundation, 2009). The states selected for these grants were perceived to be leaders in the competition; not only would they have access to money and assistance to support their

applications, but the Gates Foundation, in their announcement, stated that their selections were based on the Foundation's investigation of the states' capacity to pilot and scale reform, thereby giving the 15 states a stamp of approval. Under pressure, Gates extended technical assistance to all states, but the perception that they had anointed the front-runners remained. This variable is intended to test whether other states were more likely to adopt policies in the select 15 (McNeil, 2009).

Gates Foundation selected states – This will be tested through an indicator variable, coded 1 if the potentially emulated state in the dyad, state B, was included in Gates' original grant and assistance recipient cohort, and 0 if state B in the dyad was not part of that original cohort. This coefficient is expected to be negative, particularly in the second time period as states were facing increasing pressure to win awards.

> H1i: Frontrunner state hypothesis: States were more likely to adopt policies from states included in the Gates Foundation's initial selection to receive funding and technical assistance to prepare a RTTT application.

> Research Question 1c: Did states that did not win Round 1, but who applied to round 2, adopt policies similar to those in Tennessee and Delaware after the announcement of their Round 1 awards?

RTTT Round 1 awards to Delaware and Tennessee were announced on March 4, 2010, in the second timeframe, leaving other states ample time to adopt policies from these two states in time for the deadline for Round 2 applications and the announcement of Round 2 winners, June 1, 2010 and August 24, 2010 respectively.

Round 1 winner emulation – This dichotomous variable will indicate if the emulated state in the dyad was one of the Round 1 winners. This coefficient is expected to be negative in Time 2, particularly in the teacher policy area. However, because Tennessee and Delaware were both involved in national college and career readiness campaigns prior to the RTTT competition and moved quickly in response to SIG funding for persistently lowest achieving schools, it would not be unexpected to see a significant negative effect for this variable before the announcement of their grants in these two policy areas.

> H1j: Round 1 winner emulation hypothesis: Adopting states were more likely to adopt
>
> policies from Tennessee and Delaware after the announcement of Round 1 awards across
>
> all three policy areas, but particularly in the teacher policy area.

3.3.6   Influence of federal actions variables and hypothesis

Research Question 2: Did state policymaking change in response to significant federal actions (e.g. the release of final program guidance, the announcement of round 1 winners)?

Allen, Pettus, and Haider-Markel (2004) and earlier work by Welsh and Thompson (1980) found that federal grants to states typically push states towards adopting policies in line with federal preferences. It may be that state policy making was solely a response to federal funding. However, the Department of Education's RTTT final notice inviting states to apply for funding indicated that states would be judged more favorably for legislation that had been signed into law than for promises of adoption contingent on receipt of the grant, but made clear that there was, nonetheless, no explicit requirement that states pass new legislation (Race to The Top Fund; Final Rule, 2010). Further, but for some overlap between the four assurance areas and the

published requirements for School Improvement Grants, a non-competitive grant program for states also funded by the ARRA, the USDOE resisted giving direction on specific legislative or policy actions that states were expected to take[13]. Additionally, the size of the RTTT grants ($20-75 million each for sixteen small states up to $350-$700 million each for the four largest states – spread over four years) was not large by state and local education spending standards. For example, while the state of New York ultimately received $700 million (Medina, 2010), the 2009-2010 budget for the New York City Schools alone was $18.5 billion (NYC Schools, 2009). Similarly, while Tennessee received $502 million in RTTT funds, the 2009-2010 general fund budget for Memphis City Schools was approximately $875 million (Memphis City Schools, 2009).

This suggests that Allen, Pettus, and Heider-Markel's (2004) findings are not necessarily applicable to RTTT, as state policy makers may not have viewed RTTT in the same way that they would have a pure incentive program. Evidence of this perception can be found in Texas, the most prominent state to decline to submit a RTTT application where the state was unwilling to make legislative changes for competitive RTTT funding (Dillon, 2010), but did make the limited policy changes necessary to receive non-competitive School Improvement Grant funds (Texas Education Agency, 2010). States may have been signaled to make policy changes by the USDOE and RTTT but were not compelled nor explicitly told to do so in order to receive the grants.

While Allen, Pettus, and Heider (2004) and others focused their attention on diffusion from the federal government to states, McCann, Shipan, and Volden (2010) investigated both vertical (federal to state) and horizontal (state to state) diffusion in response to federal policy

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[13] States were expected to specify a method of identifying their lowest performing schools and to compel those schools to adopt one of four school turnaround models (see School Improvement Grants; Final Notice, 2010).

activity. Their federal policy activities (salience and information measured by congressional hearings and proposed legislation) did not involve grants to states, but their findings may, nonetheless, be applicable if not perfectly transferrable. RTTT did not act solely as a grant program, but also as a signal of the USDOE's policy preferences for the reauthorization of the Elementary and Secondary Education Act (ESEA) (Klein, 2010). McCann, Shipan and Volden (2010) found that federal activity conditionally impacted state policy making activity. States with more professional legislatures or those that had strong economic interests in the area of the legislation were more likely to enact legislation. Additionally, they found that federal-level attention to an issue did not impact horizontal diffusion.

The use of the piecewise linear growth model and the inclusion of the indicator for Round 1 winners are intended to investigate whether federal preferences influenced state policymaking trajectories by analyzing the period before the release of final federal guidelines and the period after the release of federal guidelines, i.e. before and after the states had clear signals of federal preferences. If states were attuned to federal actions and federal preferences, we would expect the slope intercepts for Time 1 and Time 2 to change and that the impact of the independent variables in the model will change between the two time periods. Further, we would expect the impact of the *Round 1 winner* variable to be significant in the second timeframe. These effects should be particularly clear in the teacher policy area, as this was the policy area most clearly linked to the RTTT initiative. College and career readiness policies have been generally changing across states since the mid-2000s due to the work of national organizations such as Achieve and the National Governor's Association. Persistently lowest achieving schools policies may have started changing early in the 18-month period as a result of the School Improvement Grants program.

Hypothesis 2a: Federal influence hypothesis: Federal actions are expected to impact state policymaking behavior. The effects of focal and control variables are expected to change between the two time periods, particularly in the teacher policy area.

Research Question 3: Were there differences in state policymaking or policy emulation behavior across the three policy areas included in this study (teacher and school leader policy, college and career readiness policy, lowest-performing schools policy)?

3.3.7 Differences in effects on diffusion processes across policy areas variables and hypotheses

In analyzing the three policy areas separately I would like to better understand whether there were differences, given political and economic constraints, in where states looked for policy ideas across college and career readiness, teacher, and persistently lowest achieving schools policies. Though the three policy areas all have potential political and economic costs, the teacher policy area may have been the most politically fraught. College and career readiness may have some costs associated with it, as schools and higher education institutions had a stake in the states' approach to assessing and ensuring post-secondary readiness, but would, presumably, not engender the same potential opposition from teachers' unions that teacher and policy changes may have invited. Similarly, while persistently lowest achieving schools policies changes may have increased financial costs, the groups most impacted by these policies do not typically have political organizations on par with those of teachers' unions.

H3a: Differences across policy areas – The effect of the independent variables, particularly those capturing teachers' union strength, the impact of federal preferences,

and political and ideological impacts, will be different across the three policy areas. There will, generally, be more movement in the teacher policy area, as this garnered the most attention from the education and mainstream press.

3.3.8   Additional state level variables and hypotheses

In addition to the above, I include two control variables found to influence state policy diffusion, *Legislative professionalism (State A)* and *Geographic proximity*. *Geographic proximity* takes a value of 1 if the states in the dyad share a contiguous border. Prior diffusion research has identified states' geographic proximity as a potential influence on states' policy adoption processes, though this finding has not been consistent across policy areas, particularly when federal policymakers' attention is focused on an issue (Berry and Berry, 1990; Grossback, Nicholson, Crotty and Peterson, 2004). I do not expect states' geographic proximity to influence RTTT-related policy adoptions; the strongest effects for geographic proximity have been found in policy areas in which states are in direct competition with neighbors for revenues or are motivated to encourage or discourage population movement across state borders, as is the case for gambling and tax policy, but such effects have not been observed for education policy. *Legislative professionalism (State A)* is the adopting state's score on Squire's (2007) measure of legislative professionalism, which captures the resources available to state legislatures to research and generate new policy, e.g. the length of legislative sessions, legislators' pay and job status outside of legislative duties, and the size and budgets of legislators' offices. Prior research has found significant effects for legislative professionalism (McCann, Shipan, and Volden, 2010; Volden, 2006), and I anticipate *Legislative Professionalism* to have varying effects across the span of the competition; states with more professional legislatures may have been better

positioned to pass legislation more quickly earlier in the competition, and smaller, less professional legislatures may have been better able to reach consensus around more politically contentious policy issues later in the competition.

> *Legislative professionalism hypothesis:* States more professional legislatures will have been less likely to emulate the policies of other states, particularly during the second timeframe.

> *Geographic neighbor hypothesis:* Geographic proximity is not expected to have an effect on the likelihood of policy adoption between states.

Table 2. Independent variables, descriptions/coding, and sources

Variable	Description / Coding	Source
State Demographic Characteristics:		
State population ratio (A & B)	Population ratio of the two states in the dyad. Calculated by dividing the population of the larger state by the population of the smaller state.	Census 2010, American Community Survey
Difference in HS diploma rate (A & B)	The difference in the percent of the state's population over the age of 25 who have received a high school diploma	Census 2010, American Community Survey
State Economic Characteristics:		
Difference in per capita income (A & B)	The difference in the per capita incomes of the two states in the dyad, in thousands of dollars	Census 2010, American Community Survey
Percent change in state general revenues from prior year (A)	Percent increase or decrease in state revenues from prior year for State A of the dyad.	U.S. Census Bureau, state websites
State Political Characteristics:		
Unified Republican government (A & B)	Dummy = 1 if, for both states in the dyad, the governor and both houses of the legislature are Republican-controlled.	State websites
Unified Democratic government (A & B)	Dummy = 1 if, for both states in the dyad, the governor and both houses of the legislature are Democratic-controlled.	State websites
Difference in state ideology (A & B)	For the two states in the dyad, the difference in scores on Berry, Fording, Ringquist, Hanson, and Klarner's (2010) updated measure of state ideology.	Berry, Fording, Ringquist, Hanson, and Klarner, (2010)

Chief State School Officer elected (A)	Dummy = 1 if the Chief State School Officer in State A is an elected position	State websites

Leader States:

Gates Foundation frontrunner (B)	Dummy = 1 if state B in the dyad received initial funding and assistance from the Gates Foundation for their application.	Gates Foundation
Round 1 winner (B)	Dummy = 1 if state B in the dyad won round 1 RTTT funding	U.S. Department of Education

Union influence and local control of education expenditures:

Teachers' union contributions, per pupil (A)	Education interest group spending in state A of the dyad. Calculated by dividing each state's total interest group spending by state's number of K-12 students.	Center for Responsive Politics
Right to work law (B)	Dummy = 1 if state B in the dyad does not have a right to work law.	State websites
Percent of local education spending financed by state (A)	Percent of state's total per pupil expenditure financed by the state government for state A in the dyad.	National Center for Education Statistics

Additional State Level Influences:

Legislative professionalism (A)	Legislative professionalism for state A in the dyad.	Squire (2007)
Geographic Neighbor (A & B)	Dummy = 1 if the two states in the dyad share a border	

3.4 PIECEWISE LINEAR MODEL OF STATE POLICY CHANGE

3.4.1 Model building process and final model

The final model of state policy change in the three policy areas was built using HLM6 (Raudenbush, Bryk, Cheong, and Congdon, 2004). Working with the data for Teacher Policy, I attempted to find the best fitting model for time at level 1. The unconditional linear growth model yielded a deviance statistic of 7216.245 with 4 estimated parameters. The deviance statistic for the quadratic growth model was 6769.575 with 7 estimated parameters. A chi-squared test for goodness of fit suggested that the quadratic growth model was a better fit for the teacher data, χ^2=846.43, $p\leq0.001$, df=3. Further, the intercept of the slope of the quadratic term was significant, β_{02}=-0.102, se=0.004, $p\leq0.001$.

However, the negative sign of the coefficient for the intercept of the quadratic slope and consideration of the possible impact of the release of final federal guidance on state policymaking behavior led me to test for the fit of a piecewise growth model[14], breaking the time trajectory into two pieces. The first "piece" of time models the trajectory of state policy change, either toward or away from other states, through the month of the release of final federal guidance, November 2009; the second "piece" models the trajectory of state policy change from December 2009 through the announcement of Round 2 grant recipients. (See Table 3, below). Tests for the model fit yielded a deviance statistic of 6727.774 with 7 estimated parameters. The chi-squared test for model fit between the quadratic growth model and a piecewise growth model

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[14] Additionally, Raudenbush and Bryk (2002) suggest the examination of a piecewise growth model when there is a conceptual reason for wanting to compare the differences in growth trajectories during two time frames, which was the case for these data.

found that the piecewise growth model was a significantly better fit for the data, χ^2=41.226, $p\leq0.001$, df=0[15]. Finding that the data best fit this form of the piecewise linear growth model is important unto itself; this offers evidence that state policymaking behavior was distinct before and after the release of final program guidance (and the subsequent announcement of Round 1 winners).

Table 3. Major Round 1 and 2 RTTT time points

February 2009	American Reinvestment and Recovery Act passed (announced RTTT and established four assurance areas)
July 2009	Draft RTTT guidelines released by the USDOE
November 2009	Final RTTT guidelines published by the USDOE
March 2010	Round 1 Awards Announced (Delaware and Tennessee)
August 2010	Round 2 Awards Announced

After determining the best way to model time at level-1, I began the model building process for level-2, adding covariates in sets, starting with the unconditional model and adding, in sequence, variables for demographic characteristics (*Difference in per capita income, Difference in HS diploma rate*), economic characteristics (*Difference in per capita income, Percent of local school funds from state (A), Change in general revenue from prior year (A)*), political characteristics (*Difference in state ideology, Unified Republican government (A & B), Unified Democratic government (A & B)*), diffusion theory-related motivation and capacity

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[15] This form of the piecewise model fit significantly better than other attempts to model time, i.e. dividing up the time points into smaller pieces or including time indicators to configure the time points into different time "chunks."

(*Legislative professionalism (A), Geographic neighbors*), Front Runner status (*Gates "frontrunner" state (B), Round 1 winner (B)*), Teachers' union strength (*Right to work (B), Teachers' union contributions, per student (A)*), and selection of CSSO (*CSSO elected (A)*). Finally, I opted to remove *Geographic neighbor* as a level-2 predictor across the intercept, Time 1 and Time 2 slopes and to delete *Difference in per capita income* as a predictor of Time 1 and Time 2 slopes for parsimony and best model fit. Additionally, I tested for different configurations of time at Level-1, including quadratic terms; the model using Time 1 (March 2009-November 2009) and Time 2 (December 2009-August 2010) best fit the data.

I then repeated this model building procedure for the college and career readiness policy and persistently lowest achieving schools policy data, progressively adding sets of variables until all were in the model and then removing variables to achieve the best model fit. Though each policy area model best fit the data with a slightly different configuration of covariates, I made the decision to use the model for teacher policy for the college and career readiness and persistently lowest achieving schools policy areas. Though this sacrifices best fitting a model for each set of data, my overriding interest was in preserving comparability across the three policy areas and in testing the full set of covariates. In this analysis, as detailed below in the checks of model assumptions and the findings, the substantive interest was in changes states made to their teacher policies, both because RTTT was somewhat unique in its focus on state-level teacher policy and states appeared to concentrate their focus on teacher policy.

3.4.2   Final model and interpreting the coefficients

The model building procedure detailed above yielded the following final model, which was used to understand policy change in the three policy areas (teacher policy, persistently lowest

achieving schools policy, and college and career readiness policy. The model below highlights

the focal dependent variables for this analysis. (See Appendix H for the full model.)

Level 1:

State Dyad Policy Distance = π_{00} + π_{10}(Time 1 [March 2009 – November 2009])$_i$ + π_{20} (Time 2 [December 2009 – August 2010])$_i$ + e_{0i}

Level 2:

π_{00} = β_{00} (Intercept) Initial status
+ β_{004} Difference in state ideology [A & B])$_i$
+ β_{006} (Unified Republican government [A & B])$_i$ + β_{007} (Unified Democratic government [A & B])$_i$
+ β_{008} (Teachers' union contributions, per student [A])$_I$
+ β_{012} (Round 1 winner [B])$_i$+ β_{013} (Gates "frontrunner" state [B])$_I$
+ β_{014} (Elected CSSO [A])$_i$

$$\sum_{q=1}^{Q_0}\beta_{0q}X_{qi} + r_{0i}$$

π_{10} = β_{100} (Intercept) Growth Time 1
+ β_{104} (Difference in state ideology [A & B])$_i$
+ β_{106} (Unified Republican government [A & B])$_i$ + β_{107} (Unified Democratic government [A & B])$_i$
+ β_{108} (Teachers' union contributions, per student [A])$_i$
+ β_{112} (Round 1 winner [B])$_i$+ β_{113} (Gates "frontrunner" state [B])$_i$
+ β_{114} (Elected CSSO [A])$_i$

$$+ \sum_{q=1}^{Q_1}\beta_{1q}X_{qi} + r_{1i}$$

π_{20} = β_{200} (Intercept) Growth Time 2
+ β_{204} (Difference in state ideology [A & B])$_i$
+ β_{206} (Unified Republican government [A & B])$_i$ + β_{207} (Unified Democratic government [A & B])$_i$
+ β_{208} (Teachers' union contributions, per student [A])$_i$
+ β_{212} (Round 1 winner [B])$_i$+ β_{213} (Gates "frontrunner" state [B])$_i$
+ β_{214} (Elected CSSO [A])

$$+ \sum_{q=1}^{Q_2}\beta_{2q}X_{qi} + r_{2i}$$

3.4.2.1   Directed dyad dependent variable and interpretation of the coefficients

In interpreting the model and the effects for the dependent variables, it is important to understand the advantages of using the directed dyad form of the dependent variable to capture state policy change. First, by using a measure of the distance between state policies, I am able to track state changes not just on a single policy, as has been common in much of the prior research on state policy change, but, rather, multiple policy indicators. The policy distance measure that forms the dependent variable for this analysis tracks the distance of state policies on a set of policy components. This is a more sensitive measure of whether states are truly adopting similar policies. For example, a teacher evaluation policy that requires districts to evaluate teachers annually, mandates the inclusion of student growth on statewide standardized assessments in that evaluation, and links the evaluation findings to teacher compensation is fundamentally different than a state law requiring that districts evaluate teachers annually but which does not mandate that the evaluation incorporate specific measures or link teacher compensation to the outcome of the evaluation. Nonetheless, these policies both fall under the umbrella of teacher evaluation. The use of the set of policy characteristics, or indicators, is intended to capture these nuances.

The use of the directed form of the directed dyad dependent variable allows even more fine-grained analysis of state policy change. As detailed above, the directed dyad looks at pairs of states and allows for the examination of the direction of policy movement. For example, between Time 2 (November 2009) and Time 3 (March 2010), Illinois changed its teacher policies. Without the directed dyad, it would be difficult to understand the characteristics of the states Illinois may have emulated; for example, in the directed dyad for one case we see that Illinois moved its policies towards a state that had been selected as a Gates Frontrunner state,

Georgia (Time 2 distance = 4.359, Time 3 distance = 4.000), and away from a state that had not

been initially selected to receive a Gates Foundation application preparation grant, Iowa (Time 2

distance = 3.606, Time 3 distance=3.873). Meanwhile, at those same time points, Iowa had not

changed its policies, and Georgia had actually moved its policies away from Illinois', as this

distance is measuring Illinois policies at Time 3 v. Georgia policies at Time 2 and Georgia

policies at Time 3 v. Illinois policies at Time 2. (The construction of the dependent variable is

described in more detail above). I can detect the movement towards the Gates Frontrunner state

through the inclusion of an indicator variable (Gates Frontrunner State) that takes a value of 1

when Georgia, or any other Gates selected state, is the second (policy sending) state in the

directed dyad. Similarly, I have included variables that capture characteristics for the first (policy

adopting) state in the dyad.

3.4.2.2   Interpreting the fixed effects coefficients

Given the somewhat unusual form of the dependent variable, it is important to understand the

interpretation of the signs of the coefficients for the focal independent variables highlighted in

the final model, above. I focus first on the state politics variables, most of which are measures of

states' political and ideological similarities, and then on the union and frontrunner/Round 1

winner variables, which are constructed to measure the impact of characteristics of either the

policy sending (A state) or policy receiving state (B state).

As explained more extensively in research hypotheses and independent variables section

above, *Difference in state ideology* is the distance between states on Berry et al (2010)'s measure

of state ideology. This coefficient for this would be negative if states are adopting policies

similar to states that are more ideologically distant. So, for example, if the policy adoption

patterns of many states in Time 2 were similar to the Illinois and Georgia example in the prior

section, we would expect this coefficient to be negative in Time 2, as *Difference in state ideology* between Illinois and Georgia is 43.046, well above the mean for this variable *(M* = 16.074). If Illinois were adopting policy from a more ideologically similar state, e.g. Iowa (*Difference in state ideology* for Illinois and Iowa is 4.198), and many other states were making similar changes towards policies in ideologically similar states, we would expect the coefficient to be positive.

  Same Unified Republican Government and *Same Unified Democratic Government* are similarly constructed to indicate whether the two states in the dyad have governments controlled by the same political party. They are dichotomous variables, taking a value of 1 when both states in the dyad share this unified party-control characteristic, and captures whether states are adopting policies from governments controlled by the same political party. If states are adopting policies from states controlled by the same political party as controls their governor's office and state legislature, we would expect this coefficient to be negative. (The distance between the states' policies decreases and the indicator variable is 1.) For states under split party control, this variable never takes a value of 1 for a dyad in which they are a state (e.g. a Democratic Governor, a Democratic-controlled State Senate, and a Republican-controlled State House).

  Elected CSSO is an indicator variable identifying policy adopting states (i.e. State A or the first state in the dyad) as having an elected Chief State School Officer. (States with appointed CSSOs form the reference group.) It is a reasonable assumption that CSSOs who must face statewide reelection would be less likely to take politically riskier policy positions, particularly in teacher policy, than CSSOs who are appointed. Education interests have a much clearer Election Day target in an elected CSSO than they would for a governor who appoints the CSSO, as a much broader range of state issues influences a governor's election. The *Elected CSSO* variable takes on a value of 1 if the first state in the dyad elects its CSSO, and if its coefficient were

positive, it would indicate that CSSO-electing states are adopting policies more distant from other states, as compared to states with an appointed CSSO.

Teachers' union contributions, *per student*, *in dollars* in State A, as explained above, and acts a proxy for the influence of a state's teachers' union on state policymaking, as political spending is often associated with political strength. This is a standardized measure (the total contributions divided by the number of K-12 students in the state) and has a mean value of 3.17 dollars. By capturing the political contributions for the first state in the dyad the coefficient for this variable will yield information about the ability of state teachers' unions to influence policy during this time frame. If teachers' unions' contributions appear to impact state policymaking, this coefficient will be significant. If the coefficient is positive, it indicates that as teachers' unions' contributions increase a state is less likely to adopt policies similar to other states. The effect of this variable may be particularly informative for teacher policy. A negative coefficient would suggest that increasing teachers' unions' contributions did not deter states from adopting policies similar to other states at a time when states were generally converging around more prescriptive evaluation policies incorporating measures of student growth.

The two indicator variables included to understand whether states were adopting policies similar to those in states that were either designated as Round 1 winners or RTTT "frontrunners," by virtue of their selection to receive a Gates Foundation grant to assist in the preparation of their application, are constructed in similar ways. If the B state in the dyad, i.e. the state from which policy is adopted, was a Gates selected state or was a Round 1 grantee, *Gates "frontrunner" state* or *Round 1 winner* will take a value of 1, respectively. (In fact, only Tennessee was both a selected as a Gates grantee and a Round 1 winner.) The interpretation of both of these variables is similar. If states are largely adopting policies from states selected to receive Gates Foundation

grants, the sign of the coefficient for the *Gates Frontrunner State* will be negative as the policy distance between other states and the Gates Frontrunner states is narrowing and states are moving more towards the policies in the Gates grantee states than they are towards the policies of states that were not selected to receive Gates grants. For the *Round 1 Winner* variable, if states are generally adopting policies more similar to those of Tennessee and Delaware, the two states that won RTTT Round 1 grants, the coefficient for the variable will be negative, indicating states are moving more towards the policies of the states that won RTTT Round 1 than towards the policies of states that did not win Round 1. If both variables are negative and significant in Round 2, we will have evidence that other states were more likely to adopt policies from states that were thought to be most reflective of federal preferences or explicitly chosen as exemplars by the federal government.

Together, the variables discussed in this section are intended to measure the influence of politics and federal preferences on states' policymaking decisions. The use of the directed dyad dependent variable allows the inclusion of independent variables that measure the influence of characteristics of policy adopting states, of policy sending states, or of both states in the dyad to understand the numerous factors that may have influenced state policy decisions during the first two rounds of RTTT.

3.4.3 Assessing model assumptions

In order to assess the assumptions of HLM with the final models, Level 1 and Level 2 residual files were examined for each of the three policy areas.

3.4.3.1   Assumptions checking for the model for teacher policy:

An examination of the level-1 residuals file (see Figure 50. Teacher policy, plot of level 1 residuals / Time 1) suggests that though the model meets the assumption of normal distribution of level 1 variance, there is a slight positive trend in the plot of level-1 residuals and predicted values, which suggests that there may be additional variables that could be included in the model (Raudenbush and Bryk, 2002). However, this finding for level-1 is not necessarily surprising since Level-1 models time and does not include any explanatory variables. The test of homogeneity of level-1 variance indicates that this model meets the assumption, χ^2=122.213, p>0.500, df=741.

The level 2 residuals file suggests that while there may be some deviation from multivariate normality, the covariates included in the model meet assumptions of linearity. In addition, the model appears to meet the assumption of heterogeneity of level-2 variance (See Appendix G). The deviation from multivariate normality may be the product of outliers inherent in a study of states. California, the most populous state included in this analysis, for example, is significantly larger than Wyoming, the least populous state, and the vast differences between these two states are not limited to population. Though these differences may make them and any dyads in which they are either the policy sending state or the policy receiving state "outliers," in that they are very distinct from other states, California and Wyoming cannot simply be excluded from the analysis. As noted below, to address this deviation from multivariate normality, I will interpret the results for the final estimation of fixed effects with robust standard errors.

3.4.3.2 Assumptions checking for the model for persistently lowest achieving schools policy

For the model as applied to persistently lowest achieving schools, the level-1 residuals file suggests that the model nearly meets the assumptions of linearity. The plot of level 1 residuals and predicted values shows a slight positive trend, similar to that observed in the model of teacher policy. A check of the assumption of homogeneity of level-1 variance indicates that the model meets the assumption for the persistently lowest achieving schools data, χ^2=32.595, $p>0.500$, df=295.

Assessments of level 2 assumptions show that there is a more apparent deviation from multivariate normality than for teacher policy. The deviation from multivariate normality indicates that there are explanatory covariates missing from the final model, perhaps not surprising since the model was built to best fit the data for teacher policy. For substantive reasons, however, I chose to use this model. First, teacher policy is of primary interest in the analysis because state-level policy related to teachers was most likely to be influenced directly by RTTT. As explained more extensively in the second findings chapter, though there had been significant efforts prior to RTTT to influence college and career readiness and persistently lowest achieving schools policy at the state level by both outside organizations (e.g. Achieve) and the federal government (e.g. NCLB), RTTT somewhat uniquely targeted state level teacher policy. Recent efforts to influence teacher policy have focused primarily on districts, as is the case for grants by the Gates Foundation, American Federation of Teachers, and the USDOE's Teacher Incentive Fund. Further, in order to preserve the ability to compare the results for the covariates of interest across policy areas, it was necessary to use the same model across the three policy areas. The potential for substantive findings outweighed the understanding that the final teacher

model would not be the best fitting model for persistently lowest achieving schools policy or for college and career readiness policy.

Similar to the findings for the model applied to the teacher policy area, the level-2 covariates do not appear to violate the assumptions of linearity, aside from a few inherent outliers. To address these violations of assumptions, I will interpret the results with robust standard errors. Finally, the model appears to meet the assumption of heterogeneity of level-2 variance (see Appendix G).

3.4.3.3   Assumptions checking for the model for college and career readiness policy

Plots of the level 1 residuals suggest that the model very nearly meets the assumption of linearity at level; the plot of level 1 residuals and level 1 fitted units shows a very small relationship. The histogram of level 1 residuals suggests an approximately normal distribution (See Appendix G). The test of the assumption of homogeneity of level-1 variance indicates that the model meets the assumption for the college and career readiness data, χ^2=60.427, p>0.500, df=383.

Scatterplots of level 2 covariates against the level-2 residuals for the model with all other covariates suggests that the model meets the assumption of linearity at level-2. Similar to the data for persistently lowest achieving schools, there does seem to be deviation from multivariate normality at level-2.

Because there is some evidence of a violation of assumptions, particularly in multivariate normality at Level-2 for college and career readiness policy and persistently lowest achieving schools policy, I will report the results with robust standard errors, which is appropriate given the large number of level 2 units and the stability of the standard errors across results reported with and without robust fixed effects (Raudenbush and Bryk, 2002). Across all policy areas and all

models, results were substantively the same for the final estimation of fixed effects with and without robust standard errors.

3.5 LIMITATIONS

Though attempts will be made to address the problems with the assumption of level 2 multivariate normality by interpreting the estimations of fixed effects with robust standard errors, this study has limitations that cannot be addressed through any estimation or model building process. Perhaps most prominently is the form of the dependent variable in the analysis. Unlike research in international relations where there is an observable event represented by the dependent variable, in this analysis I am attempting to model unobserved phenomena–one state's imitation of another state's policy idea and the influence of federal preferences on state policy. Though prior research has justified the use of the directed state-dyad dependent variable for policy diffusion studies, the assumptions that there is a process to be modeled and that unobservable processes can be captured quantitatively.

Qualitative researchers, including GAO researchers investigating RTTT state-level policy change, have shown that there are limits to the conclusions we can draw from event history models. Interviews with policy makers suggests that they may not perceive policy change as a diffusion process that can be modeled by state characteristics and external influences. Nonetheless, just as there are limitations to quantitative methods, qualitative research on diffusion processes are limited by policy makers' ability to recall events or their willingness to recall events. For example, in the U.S. Government Accountability Office [GAO] (2011) study of RTTT, only 6 states reported policy changes to be competitive for RTTT, yet a review of

policies passed in the 18-month period under examination in this study reveals at least 13 additional states specifically mentioned RTTT in the first versions of education bills they passed, suggesting that the recollections of GAO's interviewees may not have been accurate.

In addition these issues, Boehmke (2009) has shown that the directed state-dyad event history analysis on which this analysis is based may be biased toward finding diffusion processes when, in fact, the observed phenomenon is states' convergence around a single policy. He suggests a simple correction–dropping states that have the same policy in a time period because, by having the same policy, there is no risk that they will emulate one another within that time period. Gilardi and Füglister (2008) suggest that this may not be a problem for analyses of policy areas where the dependent variable represents a mix of policy characteristics, such as that which I examine. Further, the coalescence around a set of policy characteristics can be viewed as evidence supporting the hypothesis that clear indications of federal policy preferences in the context of a competitive grant program can move states to make substantive policy changes corresponding to federal preferences.

The two following chapters will set forth the results of this research. The first findings chapter will explore what policy changes states made in the three policy areas during this time period, augmenting quantitative descriptive data with short case studies of several states' policymaking between the announcement of RTTT and the announcement of the final winners, drawing on national and prominent state media reports. The results of the piecewise linear growth models for the teacher, college and career readiness, and persistently lowest achieving schools policy will be presented in the second findings chapter.

4 FINDINGS: POLICIES ENACTED AND CONTEXTS FOR STATES' POLICY DECISIONS

In order to understand the quantitative model of states' policymaking, it is helpful to know more about states' policy decisions and the state-level contexts in which those decisions were made. This chapter presents information about the policies states passed in the three policy areas (teacher policy, college and career readiness policy, and persistently lowest achieving schools policy) and presents short case studies of the political and policy environments in five states over the course of the competition. These case studies, drawn from state newspaper articles and politics news wires, offer more nuanced views that may help in understanding the results of the quantitative models presented in Chapter 5.

4.1 WHAT POLICIES DID STATES ENACT?

During the 18-month span of the first 2 rounds of RTTT, states made a number of significant changes in the three policy areas. States across the country enacted policies to implement statewide teacher evaluations, create individual and school-level pay for performance programs, change or remove teacher tenure protections, begin end-of-course testing, report the post-secondary remediation needs of high schools' graduates, require all students to develop written individual graduation/post-secondary plans by the end of middle school, allow for state take over

of underperforming schools, increase charter school caps, and permit non-governmental organizations to takeover the academic and administrative responsibilities of schools, among many other provisions. In this study, only substantive policy changes were included in the analysis; bills or administrative policies that made small tweaks to language in the education code were not considered. In addition, the policy indicators used to code the policies further restricted the policies included in the data set. For example, Florida's law requiring schools to designate an "Academic Scholarship Signing Day" with comparable fanfare to the schools' "Athletic Scholarship Signing Day" ceremonies would fall under the realm of college and career readiness policies, but was not included in the analysis.

During the first time period of this analysis, March 2009 to November 2009, states passed 21 teacher policy bills or administrative polices, 17 college and career readiness policies, and 14 persistently lowest achieving schools policies. From December 2009 through August 2010, which spans the period after the release of federal guidance, the end of the first round competition, and the announcement of the first round winners through the announcement of the second round grantees, states passed 30 teacher policies, 31 college and career readiness policies, and 23 persistently lowest achieving schools policies. Maps showing the pattern of state adoptions are included below.
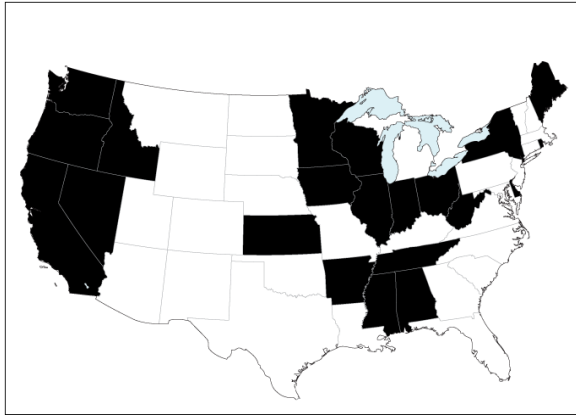
**Figure 1. States enacting teacher policies,
March 2009-November 2009**
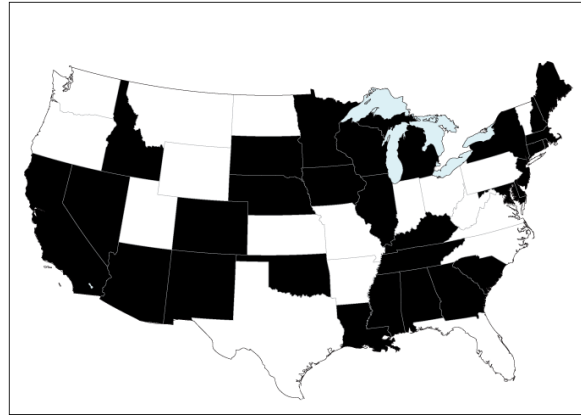
**Figure 2. States enacting teacher policies,
December 2009-August 2010**
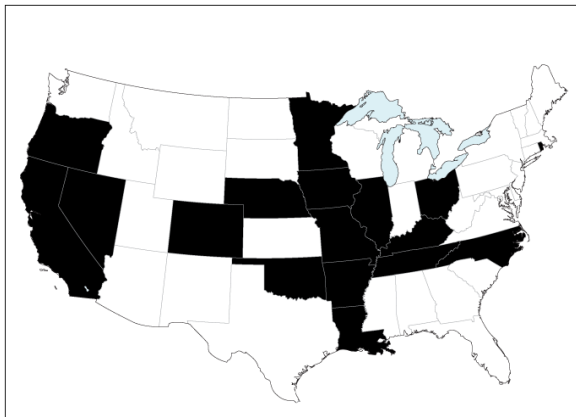
**Figure 3. States enacting college and career readiness
policies, March 2009-November 2009**
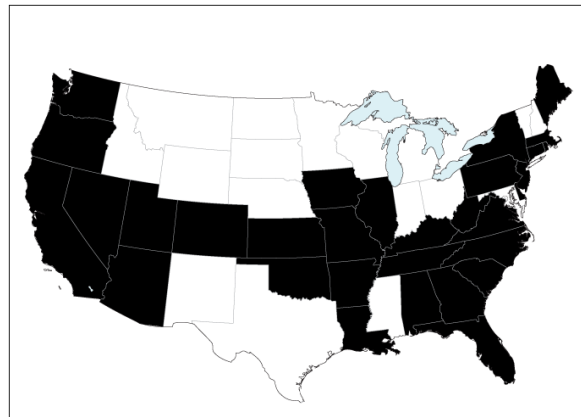
**Figure 4. States enacting college and career readiness
policies, December 2009-August 2010**
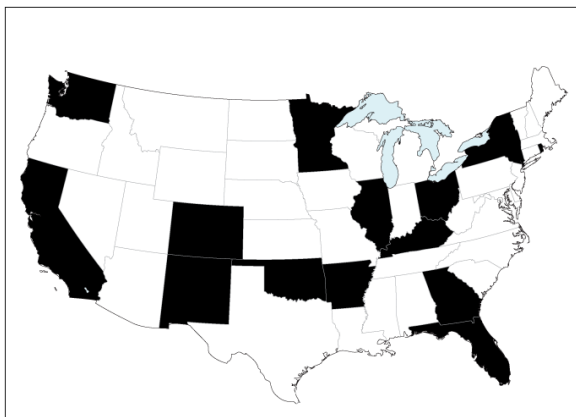
**Figure 5. States enacting persistently lowest
achieving schools policies,
March 2009-November 2009**
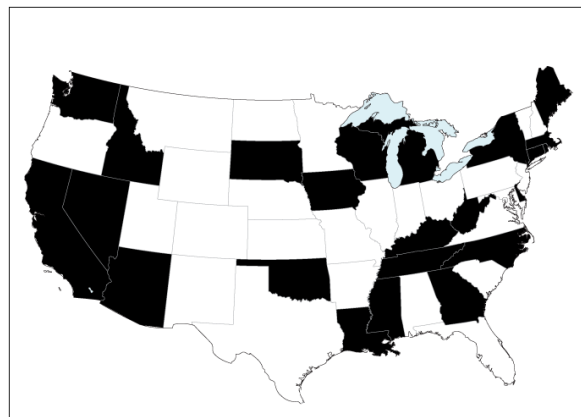
**Figure 6. States enacting persistently lowest
achieving schools policies,
December 2009-August 2010**
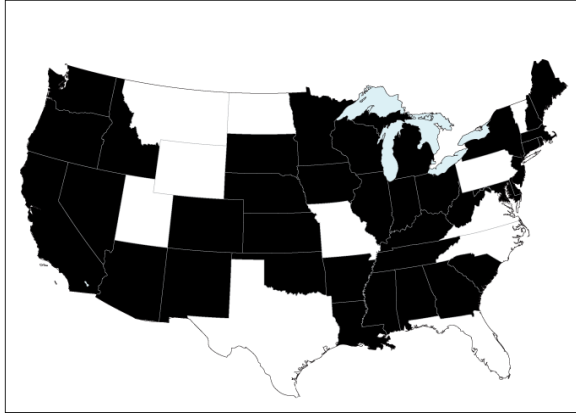
**Figure 7. States enacting teacher policies,
March 2009-August 2010**
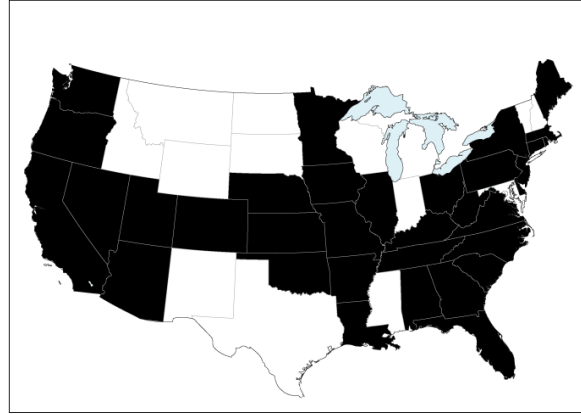
**Figure 8. States enacting college and career readiness
policies, December 2009-August 2010**
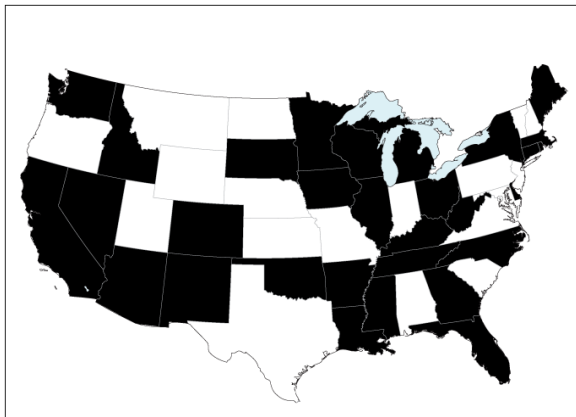
**Figure 9. States enacting persistently lowest
achieving schools policies, March 2009-August 2010**
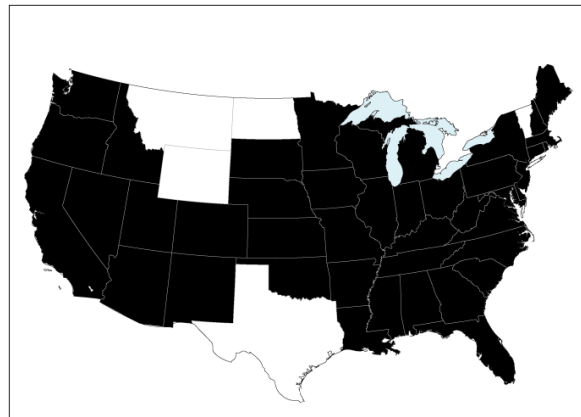
**Figure 10. States enacting teacher, college and career
readiness, or persistently lowest achieving schools
policies, March 2009-August 2010**

While these figures capture which states passed policies in each of the three policy areas, an even more interesting story of state policymaking during this time emerges from state newspaper reports. In the following section, I delve into the reports from 5 states, Florida, Georgia, Oklahoma, Colorado, and Minnesota. These states were selected because they represented eventual grantees (Georgia, Florida), states that were initially selected to receive Gates application assistance grants (Georgia, Florida, and Minnesota), and states that put forth

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significant effort but did not receive a grant (Colorado and Oklahoma). These vignettes offer insight into the contexts in which RTTT-related policymaking took place.

4.2   POLICYMAKING IN THE STATES

To construct these small studies of on-the-ground education policymaking and politics, I conducted an extensive search of Lexis-Nexis and EBSCO databases using the keywords "Race to the Top," "RTTT," "education," and "Race to Top," downloading all articles published in the states' newspapers between February 2009 and December 2010. Where there were gaps in coverage, I consulted the websites of other sources of state news (e.g. press releases, news wire services). After removing the articles not relevant to education, I synthesized the newspaper articles into the articles below. In my analysis of the articles, I paid particular attention to mentions of stakeholder involvement, proposed and enacted legislation and legislative processes, and the broader political context in which the RTTT applications were developed. Finally, if the focus of much of these descriptions of state policymaking is on teacher-related policy (evaluation, compensation, and employment rules), it is a reflection of the magnitude of the attention lawmakers and the media gave to it.

4.2.1   Minnesota: From frontrunner state to second round withdrawal

Selected as a recipient for a Gates Foundation RTTT technical assistance grant to prepare its application, Minnesota was an early favorite to receive a RTTT grant. Over summer 2009, the state legislature passed a broad education reform bill that revised state standards, linked high

school exit exams to post-secondary requirements, changed accountability reporting rules–adding requirements to report school-level student academic growth, established coordination and data sharing requirements for the state's PK-20 systems, enacted a teacher performance pay program, and revised the state's charter school laws. In October 2009, the state legislature began hearings on the state's proposal, and state education officials embarked on a tour of the state to gather input from education stakeholders ("House members," 2009; "Minn. education officials," 2009). Between March 2009 and August 2010, the state passed 7 education bills, all but one of which focused on a small aspect of the education system.

The state's early frontrunner status, bestowed by organizations outside the state, did not account for the increasingly acrimonious relationship between the executive branch and the state teachers' union and its local affiliates, which would hinder the competitiveness of the state's Round 1 application and serve as a block for the state's Round 2 application. For the state's Round 1 application, 300 of 350 of the state's districts and 115 of the state's 150 charter schools signed letters of support or MOUs in support of the state's Round 1 application, but only 12 percent of the state's local teachers' union affiliates signed onto the state's proposal (Bakst, 2010; Boldt, 2010b). Shortly after the submission of the state's Round 1 proposal, the governor was quoted referring to the state's teachers' union, Education Minnesota, as a "choke point" for education reform in the state, adding "[Democrats] won't cross them and about a third of Republicans are under their spell" (Salisbury, 2010). The union's opposition to proposals to place high performing teachers in low-performing schools, to allow alternative teacher preparation and certification programs in the state, and to closely link teacher evaluation, compensation, and employment decisions to student academic growth (Boldt, 2010a). Upon hearing that the state was not selected as a finalist in Round 1, Governor Pawlenty's spokesman

commented, "It's hard to race to the top with an anchor tied to your leg. For years, the teachers union has fought against any meaningful education reform (States News Service [MN], 2010). The teachers' union and its supporters in the legislature countered that the executive branch had done little to include representatives from local districts, teachers unions, or the legislature in the process (Boldt, 2010a; Johns, 2010a).

In subsequent months, prior to the Round 2 application deadline in June 2010, relationships between educators and their unions, the legislature, and the Governor and Department of Education remained strained and characterized by periodic sniping. Following the state's Round 1 loss, the governor proposed education legislation to allow for alternative certification programs, teacher and leader evaluation tied to student growth, performance pay for teachers tied to evaluation ratings, and tenure reform that would require teachers to reapply for certification and tenure every 5 years. The governor's admonitions that the state's education system was 'a relic' and threats to not apply for a Round 2 grant did not win passage of his preferred legislation (Johns, 2010b). Some Democrats agreed to back the alternative licensure legislation but there was no significant push to pass evaluation or other reforms, and by mid-April the governor opted to put forward his own comprehensive reform legislation. The comprehensive legislation proposed:

- Aligning teacher preparation standards to K-12 student standards;
- Adding requirements for teacher certification, including passing a basic skills test and learning to teach online courses;
- Incorporating ISLLC standards into school leader licensure requirements;
- Authorizing alternative certification program;
- Creating a three tiered teacher licensure system;
- Development of a statewide evaluation system for teachers and principals with 50 percent of the evaluation dependent on student growth (35 percent from a student achievement growth measure and 15 percent from other measures of student achievement);
- Requiring teachers and school leaders to have their tenure reviewed every 5 years;

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- Allowing superintendents to assign teachers and administrators rated "highly effective" to low performing schools;
- Permitting state takeover of low performing schools.

In the governor's press release, he specifically cited the reforms passed in states such as Maryland to improve states' RTTT applications (Hoppin, 2010; "Governor Pawlenty introduces," 2010).

The governor stated that in order for the state to apply for Round 2 funding, legislators would have to pass the reforms within 3 weeks. As the deadline approached, media reported divisions in the state's Democratic legislators over the reforms, counter proposals from Education Minnesota, and the decreasing likelihood that the legislation would pass. Provisions that would allow alternative certification programs were particularly problematic for the union and some lawmakers (Johns, 2010c; Patterson, 2010). In mid-May, state media were reporting that the bill would not make it out of the state Senate (Draper, 2010) and when the legislature adjourned without passing any of the governor's education legislation, he announced that the state would not apply for RTTT Round 2 funding (Boldt, 2010c).

4.2.2 Oklahoma: Not a finalist in spite of significant policy changes

Between March 2009 and August 2010, Oklahoma enacted 40 pieces of education legislation and adopted 3 significant education rules. These policies included changes in the length of the school year, in the state's charter school laws, in reporting, governance and remediation requirements for low performing schools and districts, and in tenure and evaluation rules for teachers and school leaders. Much of the policy activity in the 2009 legislative session focused on college and career readiness initiatives, specifically creating a P-20 governing council and requiring high schools to report remediation and performance of their graduates in their first year of post-

secondary matriculation; the bulk of the activity governing low-performing schools, modifying teacher and school leader evaluation, and removing caps on the number of charter schools in the state took place in May and June of 2010.

Though not considered one of the early favorites to receive a RTTT grant, Oklahoma policymakers and statewide media were optimistic about the state's chances. As early as March 2009 an editorial in the Oklahoman and an article in the Tulsa World reported the belief that the state's well-regarded early childhood education system would make the state a strong contender ("Stimulus money," 2009; Myers, 2009). In an attempt to increase the state's viability, a group of Oklahoma foundations hired a consulting firm to rate the state's policies relative to the program requirements, raised money to support the development of the state's application, and funded the creation of a new education advisor office in the governor's office to guide the state's application, filled by the former Mayor of Tulsa, who had been involved in the city district's application for a Gates Foundation Teacher Effectiveness grant (Hoberock, 2009; "Taylor named," 2009).

This optimism and efforts in the executive branch were not matched by education reform activity in the state legislature in late 2009 after the release of RTTT program guidance, in spite of ongoing media attention (Casteel, 2009; Eger, 2009). Though there had been discussion of altering the laws restricting the number and location of the state's charter schools and a few legislators had discussed funding teacher merit pay programs, most legislative action had taken place mid-year and had focused on P-20 coordination, data, and reporting systems, as mentioned above ("Charter schools," 2009; "State asked," 2009). Shortly before the January deadline for Round 1 applications, the State Superintendent suggested that in order to be competitive, the legislature would need to take action ("Racing ahead," 2010). The state's application was

submitted without significant legislative changes, suggesting instead that future legislation would draw significantly from the Tulsa Public School's unsuccessful application for a Gates Foundation Teacher Effectiveness grant (Eger & Myers, 2010).

By the end of February, the Republican leadership in the state legislature introduced bills to enact a pilot performance pay program and to expand the state's charter schools (Bisbee, 2010; Eger, 2010a; Hoberock, 2010a). Several days after the pilot performance pay plan passed the House, however, the state learned that it had not been selected as a finalist for Round 1 of the RTTT competition (Rolland, 2010a). The significant push for changes to the state's laws governing charter schools and charter school authorization, teacher and school leader evaluation, compensation and continuing employment, and low-performing schools and districts came in the wake of the April announcement of the state's 34th place finish in RTTT Round 1 (Myers, 2010a; Hoberock, 2010b). During May and June 2010, the legislature passed and the governor signed reforms to:

- Create the Oklahoma Teacher and Leader Effectiveness Evaluation System to rate the effectiveness of teachers and leaders and to allow for tenure and employment decisions to be made on the basis of those ratings, 50% of which would be based on measures of student achievement (35% student growth and 15% other achievement measures);
- Authorize a optional teacher pay for performance system based teachers ratings under the Oklahoma Teacher and Leader Effectiveness Evaluation System;
- Remove the state cap on charter schools, recruit applications from nationally successful Charter Management Organizations (e.g. KIPP), and expand the organizations authorized to issue charters;
- Direct the state Board of Education to adopt the Common Core standards by August 1, 2010;
- Require the state's lowest performing schools to adopt one of four turnaround models.

The process of passing teacher evaluation legislation was somewhat contentious, though significantly less so than in other states, as the state's teachers' union supported the evaluation and compensation reforms, but local union affiliates' concerns about the evaluation system led

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many to decline to sign onto the state's RTTT application (Rolland, 2010b; Eger, 2010c). State leaders were hopeful for a better showing in Round 2 of the competition (Eger, 2010b). In spite of a significant increase in the state's point total (almost 100 points over the Round 1 application) and place (from 34th to 20th), the state did not finish high enough to be selected as a finalist. Second round reviewers praised the state's reform measures, but cited the lack of support from districts and local union affiliates, which was, in part, a result of the state's significant legislative actions (Myers, 2010b; "Oklahoma did better." 2010).

4.2.3   Florida: Teacher compensation and tenure legislation, teachers' unions, and Republican primary politics

In August 2009, the Florida Department of Education opened a portal through which school districts and other education stakeholders could submit ideas for the state's RTTT application and the state was selected to receive an application grant from the Gates Foundation (States News Service [FL], 2009a). This early progress suggested that the state's selection as a RTTT grantee was somewhat inevitable. Over the following year, however, the state's political environment and relationships among its policymakers and education interests grew increasingly strained.

The first indication that the political climate in Florida could interfere with the state's RTTT application process came in September 2009 when the Florida House Republican Caucus released a sniping statement accusing state Democrats of reversing their opposition to education reforms they had long opposed in order to boost the state's RTTT application (States News Service [FL], 2009b). By December 2009, as the state struggled to find districts to sign onto the state's RTTT application, Republicans accused the state teachers' union of "opposing progress"

in an op-ed in the St. Petersburg Times (Weatherford, 2009) and Democrats in the state house released statements accusing the Florida Department of Education and the state's Republican Governor, Charlie Crist, of failing to make minor wording changes to the state's Memorandum of Understanding at the behest of reluctant districts.

The acrimony continued, fueled in part by the perception that the state's application preparation progress was opaque and that districts were not told what the state would expect them to do should they sign onto the grant ("Trust but verify," 2010, Sanders and Palka, 2010). The Superintendent of Pinellas County Schools expressed concern, representative of other districts around the state, that regardless of whether districts supported Florida's RTTT application or not, the state would mandate implementation of RTTT-related initiatives (Anton and Matus, 2010). In addition, the state's teachers' union and its local affiliates also felt alienated from and uniformed about the state's application preparation process. In December 2009, the Florida Education Association issued a press release discouraging local unions from supporting the application, referring to it as "fatally flawed" (Marshall, 2009). Ultimately, 59 of the 67 districts signed MOUs in support of the state's Round 1 application, but many attached an addendum to their MOU stating that they would rescind their signatures if they disagreed with the state's final plan. Only 5 local union affiliates supported the application. The head of the state teachers' union asserted that the Education Commission's actions in pursuit of the grant had "'Hurt us a great deal, because it's caused a lot of trust issues'" leading the Chairman of the State Board of Education to respond "'You have too many teachers at the twilight of their careers who are simply not prepared to work as hard or as differently as is going to be required going forward'" (Marshall and Solochek, 2010).

The state's application for RTTT funds was submitted in January without passage of any politically difficult education legislation. But in an increasingly important backdrop to the state's RTTT application (and related education legislation) emerged as the U.S. Senate Republican primary campaign intensified. Crist, the state's governor, who had been accused by some in the Republican party as being too moderate, was engaged in an primary race with Marco Rubio. Rubio criticized Crist for taking American Recovery and Reinvestment Act stimulus money and for leading the state's application for Race to the Top funds (Bousquet, 2010).

Shortly before the announcement of the state's selection as a RTTT Round 1 finalist, Republican lawmakers filed legislation, SB6, to overhaul teacher evaluation, tenure, and compensation. The legislation would have eliminated teacher tenure, allowed only annual teacher employment contracts, and tied 50 percent of teachers' evaluation and compensation to student scores on the statewide standardized assessment. Governor and candidate Crist expressed support for the legislation (Colavecchio, 2010; Fitzpatrick, 2010a). The head of the Florida School Boards Association expressed concern about the bill and stated that he feared that it would "'Do more to damage teacher morale than anything I have seen in a long time'" (Colavecchio and Solochek, 2010). Also in March, the legislature passed a bill to overhaul the state's graduation requirements, putting in place a series of end-of-course assessments that students would be required to pass in order to receive their diploma. Teachers and school administrators expressed concerns that the change would be implemented too quickly, but governor Christ stated that he would sign it (Lankes, 2010). The following day, Delaware and Tennessee were announced as the RTTT Round 1 Winners.

Not surprisingly, the announcement of Florida's RTTT Round 1 loss elicited opposing responses from the supporters and detractors of the proposed changes to the state's tenure and

evaluation systems. While teachers' unions expressed hope that the loss would discourage the bill's supporters, the sponsors of the bill characterized the state's loss of Round 1 funding as all the more reason to pass the legislation, stating that they believed passage of the bill would help the state's Round 2 application ("How Florida lost this 'Race,'" 2010; Matus and Solochek, 2010a). The Education Commissioner announced that the state will pursue a Round 2 grant, and Crist, citing the acrimony between teachers, the legislature and the Education Commissioner, took leadership over the Round 2 application. He appointed a RTTT working group comprised of a cross section of education stakeholders and announced a task force, including representatives from the state's teachers' union, to develop a statewide teacher evaluation model.

During the first week of April, SB 6 passed out of the Florida House education committee after an eight-hour hearing; the Associated Press characterized the debate as "vehement," and the committee approved the legislation on a party line vote (Kaczor, 2010). Articles note both Governor Crist and former Governor Jeb Bush supported the bill (Bender, 2010a; Kaczor, 2010; Fitzpatrick, 2010b; Larabee, 2010). Over the subsequent weeks, a spirited debate commenced in the state's newspapers' Letters to the Editors and Editorial/Opinion sections over whether Crist should veto the bill. Perhaps, more influentially, new polls suggested that he was trailing Marco Rubio in the Republican U.S. Senate primary by as much as 30 points. A *Palm Beach Post* article noted that there would be significant political advantages for Crist were he to veto the bill; though a veto would contradict his earlier support for the bill, the backlash would be mitigated somewhat by the significant support he would receive from the state's teachers' unions. In reference to the legislation, a reporter wrote, "It appears to have galvanized more Floridians than the 2007 property tax revolt or the debate over Teri Schiavo's feeding tube in 2003" (Bender, 2010b).

On April 16, Crist vetoed the bill and legislative supporters were unable to gather enough support to override his veto. Shortly thereafter, national Republicans, who had resisted taking sides in the primary, began endorsing Rubio, and Crist dropped out of the Republican Senate primary, declaring his intention to run as an independent. His political calculus appeared to have worked; the states' teachers unions decided to back both Crist and their traditional Democratic ally in the Senate campaign (Bender, 2010c; Larabee, 2010; Matus and Solochek, 2010b; Smith, 2010; Whittenburg and Mullins, 2010).

The state's Round 2 RTTT application, with a revised MOU authored by Crist's working group, gathered more district and union support than had the Round 1 application. 65 of the state's 67 school districts signed onto the application, as did 54 local teachers' union affiliates (States News Service [FL], 2010a). However, by the beginning of June, the St. Petersburg Times reported that may of the state's unions made side agreements with districts stipulating that they would be able to opt of some of the RTTT requirements if they could not be collectively bargained (Matus, 2010; McNeil, 2010; States News Service [FL], 2010b). And though their union supported the application, newspaper reports quoting teachers suggest that classroom teachers held onto a somewhat negative view of the grant and seemed broadly uninformed about the states' proposal and its implications.

When the second round RTTT grantees were announced in August 2010, Florida was among the winners. The results were not so positive for the governor or the unions, however. Crist ultimately lost his bid for the U.S. Senate to Marco Rubio. And Crist's successor in the governor's office, Rick Scott, signed legislation very similar to SB 6 into law in 2011.

4.2.4   Georgia: A Republican governor champions RTTT

In late March 2009, the Atlanta Journal Constitution published a front-page article mentioning RTTT, and from the start Georgia's Republican Governor, Sonny Perdue, was a big supporter, referring to Race to the Top as "'Almost a Nixon Goes to China opportunity'" (Badertscher, 2009). He remained active in the state's application process, appointing four RTTT "czars," corresponding to each of the federal government's four assurance areas, who met every two weeks beginning in September (Diamond, 2009). Georgia was selected as an initial recipient for a Gates Foundation grant, and, outside of long-standing problems with its longitudinal data system which lacked the capacity to link students and teachers, the state appeared to be well positioned to compete for RTTT funds (Vogell, 2009). Over the summer of 2009, the state appeared to be making steady progress, passing, among other legislation, incentives for teachers working in high-needs areas (Swartz, 2009). Perdue was both enthusiastic and willing to push policy changes to put the state in a position to win RTTT funds, stating "'Nobody, except Santa Claus, is going to give you money for nothing, and you've got to be good to get Santa Claus'" (Badertscher, 2009).

As the deadline for Round 1 applications approached, however, disagreements between education stakeholders emerged. Local school boards expressed reluctance to sign onto the state's application because they had been given little information about the state's plans, the funding their districts would receive if they did participate, and were given just a few weeks, over the winter holidays, to make a decision. Board members and superintendents noted that timing gave them little opportunity to consult with the teachers who would be responsible for implementing the state's plans (Mauldin, 2009; Sparks, Fetter, and Sellers, 2009). Nonetheless, many districts agreed out of fear of "'leaving money on the table'" (Sparks, Fetter, and Sellers,

2009). 23 districts representing 41 percent of the students in the state opted to sign onto the state's application (Mauldin, 2010).

The lack of teacher representation was notable at the state level, as well. Perdue remained in command of the state's application and, through a spokesperson, stated that because Georgia was a non-union (right-to-work) state, he did not believe there was any need to involve the teachers' association in the state's application. The Georgia Association of Educators (GAE) declined to support the application. The State School Superintendent stated that, though she believed the state had a good chance to win funds, had she been in charge of the process, she would have sought the involvement of the GAE and the Professional Association of Georgia Educators in the application (Badertsher, 2009). The head of the GAE stated that he felt the application had been developed in "'relative secrecy'" which curtailed the role of the teachers' associations in the process (Jones, 2010a).

In mid-January, Governor Perdue proposed an overhaul to the teacher evaluation and compensation system; neither of the state's teacher associations had information about the proposal before it was announced (Torres, 2010a). In their reporting of Perdue's proposal, *The Augusta Chronicle* reported the widely held, though incorrect, belief that linking teacher evaluation and compensation to student achievement was a requirement in order to receive a RTTT grant (Baxter and Pettys, 2010). In a statement, the governor's office proposed that a new teacher compensation system would cost less money because the state and its districts would no longer be required to give automatic pay increases to teachers for length of service or for earning advanced degrees (Brown, 2010). The governor's spokesman also asserted that teachers supported his proposed compensation and evaluation changes, a claim that the GAE questioned (Jones, 2010b).

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The governor's supporters in the state legislature filed legislation to overhaul the state's teacher evaluation and compensation system and to criminalize cheating on the statewide assessment in early February 2010 (Torres, 2010b). Shortly after the legislation was filed, the GAE announced its opposition to the bill, expressing concern that the legislation lacked key details, failed to specify a source of funding for implementation, and relied on a nascent peer review evaluation model that had not yet been fully pilot tested (Capek, 2010). Discussion of the legislation quieted somewhat through the beginning of March, when the state's qualification as a RTTT Round 1 finalist was announced (Torres, 2010c).

The governor's reticence to involve the state's teachers' associations in the state's application may have resulted in Georgia's loss in the first round of RTTT, in which the state finished third, less than 11 points behind Round 1 grantee, Tennessee. The head of one of the state's teachers' associations noted that the state lost points because the application lacked the support of teachers (Badertscher, 2010; Torres, 2010d). Shortly thereafter, the state Schools Superintendent announced plans to take a more active role in soliciting the input of the state's teachers in Georgia's Round 2 application (Downey, 2010a).

In the legislature, the bill promoted by Perdue to overhaul Georgia's statewide teacher evaluation and compensation system had, by the beginning of April, been relegated to a legislative study committee after failing to find sufficient support in the House Education Committee. Further, the legislature appeared to decline to fully fund the state's proposal to give stipends to teachers teaching high needs subjects or working in high needs schools (Torres, 2010d). Attempts to revive the bill by attaching its provisions to another bill were twice unsuccessful; on the last night of the legislative session, the original legislation's sponsor

attempted to find an additional bill to amend with the compensation and evaluation system provisions, but failed to do so (Torres, 2010e).

As the state prepared its Round 2 RTTT application, the state's teachers' union sent a letter to the USDOE opposing the state's application (Torres, 2010f) and the State School Superintendent announced her resignation (Sparks, 2010). Descriptions of the second round application notes its expanded description of professional development for school leaders and the inclusion of letters from additional education stakeholders and its continued inclusion of an overhaul to the state's teacher evaluation and compensation system (Torres, 2010g).

Throughout the summer, Perdue continued to have both successes and challenges with education-related issues. The Chief of Staff for the Georgia Department of Education resigned in mid-June, and the governor's attempts to get a favored candidate on the ballot for State Superintendent failed after the candidate, who had been appointed as interim State Superintended, did not get the required number of signatures (Downey, 2010b). Further, his party's candidates for statewide offices (State Superintendent and Governor) did not share Perdue's enthusiasm for RTTT and declined to go on the record supporting it (Galloway, 2010). However, the state Board of Education did adopt the Common Core standards, an initiative on which Perdue was a co-chair (Downey, 2010c). And, at the end of the summer, when the Round 2 RTTT winners were announced, the state was awarded 400 million dollars (Dillon, 2010).

4.2.5   Colorado: From relative unity to divisive debate

Almost from the moment RTTT was created in the American Reinvestment and Recovery Act, Colorado's Governor Bill Ritter and Lieutenant Governor Barbara O'Brien began preparing the state's application. At the beginning March 2009, a press release announced the creation of a

RTTT steering committee, headed by the Lieutenant Governor (States News Service [CO], 2009a); by the end of the month, legislators had introduced legislation intended to boost the state's chances of receiving a RTTT grant (Ingold, 2009). Embedded in the state's annual school funding bill were provisions to tie school funding to student performance and to require the state's high school freshmen to complete individual graduation plans (Ingold, 2009). By early April, legislators and the governor announced four goals for education legislation during the 2009 session, all tailored to RTTT: increasing the number of students designated college and career ready; establishing a PK-20 student data system; tying teacher effectiveness and promotion to student academic improvement; and providing more support to the state's lowest performing schools (Ashby, 2009a). The RTTT steering committee held its first meeting at the end of April. In contrast to other states, the meeting was open to the public and attendees were invited to serve on one of the four committees tied to the four assurance areas (Sherry, 2009; States News Service [CO], 2009b).

The early legislation, released well before the draft program guidance in July 2009 or the final program guidance in November 2009, offers evidence that though states had an idea of the goals of RTTT, they were not well informed about the specific preferences of the USDOE. For example, in a debate about a provision in the annual funding bill that would have financially penalized low performing schools, state Senators maintained that the rule would help the state's chances for RTTT funding, while the state House and the Governor believed that it would not be beneficial (Ashby, 2009b). This lack of information did note slow the progress of the state's legislation, however. In early May 2009, Ritter signed nine education bills into law, including legislation to set up a statewide PK-20 data system that could link students to teachers and administrators, to close the gap across schools in teacher and administrator efficacy and

experience, to set up a dual enrollment system for high school students to earn postsecondary credit, to standardize the requirements for the state's alternative preparation programs, and to implement the federal government's turnaround models for persistently lowest achieving schools (States News Service [CO], 2009c). And in June the Governor announced the Colorado STEM (Science, Technology, Engineering and Math) Network to promote STEM fields and STEM education (States News Service [CO], 2009d). Colorado's political leaders were so engaged in the RTTT work that when the draft federal guidance was released, *The Denver Post* referred to Lt. Governor O'Brien as an "obsessive follower" of U.S. Secretary of Education Arne Duncan and described her "poring over every sentence in Duncan's speeches for clues about how Colorado can win a slice of the competitive $4.35 billion Race to the Top fund" (Meyer, 2009a).

The relative calm in Colorado around RTTT legislation, as compared to states like Florida and Georgia, lasted through mid-December when a State Senator announced his intention to introduce a bill to reform the state's teacher evaluation, compensation and tenure system. A letter advocating an overhaul of the state's teacher policy from the Denver Area Superintendent Council to the Lt. Governor and Education Commissioner that drew a quick and accusatory response from the state's teachers' union, the Colorado Education Association, added to the increasingly charged atmosphere in the state (Meyer, 2009b). The state's political, education, and business leaders remained relatively united through the submission of the state's Round 1 application with 135 of the state's 178 school districts and a diverse set of stakeholders, including the Colorado Education Association, signing onto the application (Coors and Schuck, 2009; Dillon, 2010; Slevin, 2010; States News Service [CO], 2010a). In early January 2010, the state legislature quickly passed a new law to tie the evaluation of teacher training programs to the

classroom performance of their graduates, in time to include the legislation in the state's application (Bartels, 2010).

Following the late March announcement that the state failed to win a Round 1 RTTT grant, much of the criticism of the state's application from within the state focused on the lack of a teacher evaluation system (Coors and Isenberg, 2010; "Colorado flunks," 2010; Meyer, 2010a). Shortly after the state announced that it would apply for a Round 2 grant, Democratic State Senator and former high school principal Mike Johnston introduced SB191, a bill to tie 65 percent of administrator evaluations and 50 percent of teacher evaluations to student growth and to link compensation, tenure, and continued employment to those evaluations (Malone, 2010; Meyer, 2010b). Within a few days, after the State Board of Education voted unanimously to support the bill, the CEA stated that it would not support the state's second round RTTT application because it would be linked with SB191 ("Ed Board backs tenure reform," 2010). The head of the Colorado Senate Republican Caucus released a statement accusing the union of throwing a "tantrum" that would threaten the state's RTTT application, putting in jeopardy the potential $175 million in Round 2 funding (States News Service [CO], 2010b).

After contentious debate in the State Senate, the bill passed relatively intact to the State House of Representatives. A *Denver Post* article noted that Democrats were split on the bill, which was introduced by a Democrat, while Republicans "loudly approved" (Meyer and Fender, 2010a). The House Education Committee passed the bill on a 7-6 vote after an "emotional" eight-hour hearing. One legislator, describing the debate in the House said, "'Nobody wanted a legislative bloodbath, but we're going to play our cards'" (Meyer, 2010c; Meyer, Bartels, and Fender, 2010). The bill passed by a narrow margin in the House and Governor Ritter signed it into law shortly thereafter ("Colorado teacher-evaluation bill enacted," 2010; Meyer, 2010d).

As promised, many of the local teachers' union affiliates who had supported the state's first round RTTT application did not support the state's second application, and the Colorado Education Association withdrew its support (Meyer, 2010e). While the state was selected as a Round 2 finalist, they did not win a Round 2 grant. The lack of union support appeared to play a significant role in the state's loss (O'Connor, 2010; Meyer and Fender, 2010b).

4.3   SUMMARY

This chapter was intended to be an introduction to the policies that states passed between March 2009 and August 2010 in order to ground the quantitative results presented in the following chapter. The stories of state policy and political processes are interesting, and a few important themes emerge across the states. First, the speed with which states passed legislation was remarkable given the competing interests in state politics. For example, Colorado enacted a piece of legislation to hold post-secondary institutions accountable for the performance of their graduates in just over a week in order to strengthen the state's RTTT application. The speed of state policy changes also led to inconsistencies and legislation was sometimes passed with little information about RTTT's parameters, particularly in the first half of the competition. The importance of politics, but not necessarily political party, is also notable. While Georgia's Republican governor was a cheerleader for RTTT in spite of the death of the state's evaluation bill at the end of the legislative session, Minnesota's Republican governor withdrew his support in similar circumstances. Further, of the five states, only the two led by Democratic governors, signed more intensive teacher evaluation policies into law.

Finally, the focus on teacher policy in the second half of the competition, specifically policy governing teacher tenure, compensation, and evaluation, was significant. Teacher policy, more so than the other policy areas this study examined, served as a magnet for media and state policymakers' attention.

5 FINDINGS: QUANTITATIVE RESULTS FOR STATE POLICYMAKING DECISIONS

In this chapter, I present the results of my quantitative analyses, beginning by presenting descriptive statistics for and correlation coefficients among the independent variables included in the models. Subsequent sections will describe the results of the final growth models and the hypotheses presented in Chapter 3. The discussion will begin with separate descriptions of the results for each of the models of teacher and school leader policy, college and career readiness policy, and persistently low achieving schools policy, followed by an exploration of findings across policy areas. The purpose is to demonstrate the ways in which policymaking processes and effects of independent variables area changed over the course of the competition in each policy area, and to explore differences in the effects of the independent variables across policy domains.

5.1   DESCRIPTIVE STATISTICS

The descriptive statistics for the states and state dyads in the dataset illuminate expected and unexpected differences and similarities among states that applied for RTTT grants. (Descriptive statistics for independent variables across all observations and for the state pair observations included in the Teacher Policy, College and Career Readiness Policy and Persistently Lowest

Achieving Schools Policy analyses can be found in Table 4, Table 5, Table 6, and Table 7, respectively.)

Not surprisingly, the largest difference in large to small state population ratio, 67.910, is between California and Wyoming; Arizona and Massachusetts, however, have roughly the same population and a population ratio equal to 1. Kansas's and Iowa's residents have the same per capita income while Connecticut's and Mississippi's have the most different per capita incomes, 16,515 dollars a year. Rhode Island and Michigan are the most ideologically similar states; Massachusetts and Georgia are the most ideologically dissimilar. Only 1.5% of the state pairs in the final data have Republican governors and legislatures in both states, whereas Democrats control the governor's office and legislature in both states in 11.9% of the state pairs, reflecting the strength of the Democratic victory in elections at the local, state, and federal levels in the 2008 election. Georgia and Massachusetts form the state pair with the greatest difference in state ideology, reflecting Georgia's position as the most ideologically conservative state, with a score of 24.893, and Massachusetts's place as the most ideologically liberal state, with a state ideology score of 74.054. Michigan (61.288) and Rhode Island (61.266) form the most ideologically similar state pair. Additionally, prior research suggests that the state with the most professional legislature, California, should be best positioned to pass innovative policy and adopt policies that are most successful in other states, while New Hampshire, with the least professional legislature, has the least resources available through which their legislators can learn about policies in other states.

Turning to variables related to education, a number of states have the same rate of adults 25 years old or older who have a high school diploma, yielding some unexpectedly similar pairs of states with respect to this characteristic, e.g. Georgia and Nebraska, Kansas and Washington,

New Mexico and Wisconsin, and Nevada and Rhode Island. The proxy variable for the strength of local education interests, *Percent of Local Funding from State*, reflects the range of local funding strategies across the states. While local districts and schools receive over 75 percent of their funding from state sources in Arkansas, districts in Illinois receive less than 30 percent of their funding from the state. Teachers' unions in Oregon contribute the largest amount to political candidates and for lobbying, standardized by the number of public school students in the state, spending 26.04 dollars per student; Mississippi's Teachers' unions spend the least for political advocacy, 20 cents per student. Finally, fourteen Chief State School Officers are selected in statewide elections; all remaining states have school chiefs appointed by either the governor or the state board of education. Interestingly, in both states that won Round 1 grants, Tennessee and Delaware, the state's governor appoints the CSSO. Of all the RTTT Round 1 and 2 grantees, only Georgia and North Carolina have CSSOs selected through a statewide election. (See Appendix E for a list of states and CSSO selection processes.)

Table 4. Descriptive statistics, all observations across the three policy areas

Variable Name	N	M	SD	Min	Max
State Population Ratio	9900	4.095	5.061	1.000	67.911
Difference Per Capita Income	9900	4339.053	3418.604	0	16515
Difference High School Diploma Rate	9900	3.748	2.619	0	11.4
Difference State Ideology	9900	16.074	11.755	0.022	49.160
Legislative Professionalism (A)	9900	0.185	0.119	0.027	0.626
Unified Republican government (A & B)	9900	0.015	0.122	0	1
Unified Democratic government (A & B)	9900	0.119	0.324	0	1
Teachers' Union Contributions, Per Student (A), in dollars	9900	3.17	4.54	0.20	26.04
Geographic Neighbors	9900	0.097	0.296	0	1
Right To Work State (B)	9900	0.444	0.497	0	1
Percent of Local Funding from State (A)	9900	49.348	10.232	29.878	75.973
Percent Change General Revenue (A)	9900	2.193	4.076	-8.9	9.33
Round 1 Winner (B)	9900	0.044	0.206	0	1
Gates "Frontrunner" State (B)	9900	0.311	0.463	0	1
Chief State School Officer Elected (A)	9900	0.289	0.453	0	1
Chief State School Officer Appointed by Governor (A)	9900	0.200	0.400	0	1
Chief State School Officer Appointed by State Board of Education (A)	9900	0.489	0.4999	0	1

Table 5. Descriptive statistics, teacher policy

Variable Name	N	M	SD	Min	Max
State Population Ratio	5100	4.112	5.059	1.000	67.911
Difference Per Capita Income, in dollars	5100	4390.61	3400.17	0	16515
Difference High School Diploma Rate	5100	3.749	2.604	0	11.4
Difference State Ideology	5100	15.808	11.697	0.022	49.160
Legislative Professionalism (A)	5100	0.191	0.122	0.027	0.626
Unified Republican Government (A & B)	5100	0.013	0.115	0	1
Unified Democratic Government (A & B)	5100	0.138	0.345	0	1
Teachers' Union Contributions, Per Student (A), in dollars (B)	5100	3.284	4.358	0.2	26.04
Geographic Neighbors	5100	0.096	0.294	0	1
Right To Work State (B)	5100	0.397	0.489	0	1
Percent of Local Funding from State (A)	5100	49.448	10.720	29.878	75.973
Percent Change General Revenue (A)	5100	1.758	4.094	-8.9	9.33
Round 1 Winner (B)	5100	0.044	0.205	0	1
Gates "Frontrunner" State (B)	5100	0.310	0.463	0	1
Chief State School Officer Elected (A)	5100	0.290	0.454	0	1
Chief State School Officer Appointed by Governor (A)	5100	0.200	0.400	0	1
Chief State School Officer Appointed by State Board of Education (A)	5100	0.488	0.500	0	1

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Table 6. Descriptive statistics, college and career readiness policy

Variable Name	N	M	SD	Min	Max
State Population Ratio	3948	3.906	4.730	1.000	67.911
Difference Per Capita Income, in dollars	3948	4181.79	3327.31	0	16515
Difference High School Diploma Rate	3948	3.772	2.630	0	11.4
Difference State Ideology	3948	16.173	11.931	0.022	49.160
Legislative Professionalism (A)	3948	0.182	0.111	0.027	0.626
Unified Republican government (A & B)	3948	0.013	0.114	0	1
Unified Democratic government (A & B)	3948	0.134	0.340	0	1
Teachers' Union Contributions, Per Student (A), in dollars	3948	3.27	4.59	0.20	26.04
Geographic Neighbors	3948	0.095	0.293	0	1
Right To Work State (B)	3948	0.433	0.496	0	1
Percent of Local Funding from State (A)	3948	50.008	10.905	29.878	75.973
Percent Change General Revenue (A)	3948	1.118	3.970	-8.9	9.33
Round 1 Winner (B)	3948	.045	.208	0	1
Gates "Frontrunner" State (B)	3948	.311	.463	0	1
Chief State School Officer Elected (A)	3948	0.289	0.453	0	1
Chief State School Officer Appointed by Governor (A)	3948	0.201	0.401	0	1
Chief State School Officer Appointed by State Board of Education	3948	0.488	0.4999	0	1

Table 7. Descriptive statistics, Persistently lowest achieving schools policy

Variable Name	N	M	SD	Min	Max
State Population Ratio	3446	3.972	4.919	1.000	67.911
Difference Per Capita Income, in dollars	3446	4447.97	3490.50	0	16515.00
Difference High School Diploma Rate	3446	3.7024	2.552	0	11.4
Difference State Ideology	3446	15.374	11.327	0.022	49.160
Legislative Professionalism (A)	3446	0.199	0.119	0.027	0.626
Unified Republican government (A & B)	3446	0.015	0.120	0	1
Unified Democratic government (A & B)	3446	0.122	0.329	0	1
Teachers' Union Contributions, Per Student (A), in dollars	3446	2.99	3.99	0.20	26.04
Geographic Neighbors	3446	0.100	0.300	0	1
Right To Work State (B)	3446	0.439	0.496	0	1
Percent of Local Funding from State (A)	3446	49.555	9.464	32.997	75.973
Percent Change General Revenue (A)	3446	1.734	3.890	-8.9	9.33
Round 1 Winner (B)	3446	0.045	0.207	0	1
Gates "Frontrunner" State (B)	3446	0.314	0.454	0	1
Chief State School Officer Elected (A)	3446	0.291	0.453	0	1
Chief State School Officer Appointed by Governor (A)	3446	0.199	0.399	0	1
Chief State School Officer Appointed by State Board of Education (A)	3446	0.488	0.4999	0	1

A check of the intercorrelations of the independent variables included in the model suggests that multicollinearity is not an issue as the intercorrelations are low. All but three of the absolute values of the correlations are below 0.20; the largest correlation is between *Chief State School Officer Appointed by Governor (A)* and *Chief State School Officer Elected (A)* with a correlation coefficient of -0.319.

Table 8. Independent variables correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) PopRatio	1.000															
(2) DPCI	-0.078	1.000														
(3) DPHSD	0.138	-0.053	1.000													
(4) DSIdeo	-0.057	0.103	0.030	1.000												
(5) ALegProf	0.146	0.042	0.016	-0.068	1.000											
(6) SURep	0.092	-0.090	0.051	-0.043	-0.045	1.000										
(7) SUDem	-0.032	0.049	-0.095	-0.377	0.063	-0.046	1.000									
(8) AUnionPS	0.032	-0.055	-0.022	-0.009	0.144	-0.027	0.131	1.000								
(9) Neighbor	-0.080	-0.110	-0.037	-0.041	-0.007	0.043	-0.015	-0.003	1.000							
(10) RTW	-0.046	-0.117	-0.020	0.106	-0.393	0.139	-0.188	-0.218	0.030	1.000						
(11) APStFund	-0.027	-0.067	0.058	-0.062	-0.105	-0.042	0.060	-0.110	-0.005	0.089	1.000					
(12) APCGRev	0.008	-0.035	0.003	-0.025	-0.046	-0.012	0.021	0.190	0.000	-0.192	-0.044	1.000				
(13) BRnd1	0.036	-0.032	-0.023	-0.073	0.002	-0.027	0.034	0.003	0.020	-0.001	-0.003	0.000	1.000			
(14) BGates	-0.044	-0.047	0.041	-0.024	-0.004	0.042	0.005	0.004	0.016	-0.002	-0.002	0.004	0.088	1.000		
(15) AElectCSSO	0.083	-0.134	0.068	0.069	0.101	0.076	-0.038	0.187	-0.013	0.121	0.204	0.092	0.003	0.003	1.000	
(16) AGovCSSO	0.009	0.024	-0.051	-0.074	-0.082	-0.031	-0.009	-0.085	0.015	0.000	0.002	-0.033	-0.010	-0.003	-0.319	1.000

PopRatio (1) = State Population Ratio
DPCI (2) = Difference in Per Capita Income
DPHSD (3) = Difference in High School Diploma Rate
DSIdeo (4) = Difference in State Ideology
ALegProf (5) = Legislative Professionalism (State A)
SURep (6) = Same Unified Republican Government (States A & B)
SUDem (7) = Same Unified Democratic Government (States A & B)
AUnionPS (8) = Teachers' Union Political Contributions, Per Student (State A)
Neighbor (9) = States share contiguous border (States A & B)
RTW (10) = Right to Work State (State B)
APStFund (11) = Percent of Local School Funds from State (State A)
APCGrev (12) = Percent Change in General Revenue from Prior Year (State A)
BRnd1 (13) = RTTT Round 1 Winner (State B)
BGates (14) = Initial Selection for Gates Application Grant (State B)
AElectCSSO (15) = Chief State School Officer Elected (State A)
AGovCSSO (16) = Chief State School Officer Appointed by Governor (State A)

5.2 MODEL RESULTS

Subsequent sections will discuss the results of the final model in detail, discussing the findings in each of the three policy areas in the two time periods. I will then examine the findings across the three policy areas in an attempt to explicate similarities and differences in the effects of relevant variables, referring back to the hypotheses proposed in Chapter 3. For all models, I ran state fixed effects models to control for state idiosyncrasies and as a check of the robustness of my findings; I will be discussing these results as relevant.

Given differences in attention to each of these areas by both the federal government and non-governmental organizations between March 2009 and August 2010, it is reasonable to expect varying impacts. For example, while college and career readiness was an underlying theme in many of the federal government's communications to states during this time, initiatives such as Achieve's American Diploma Project and the National Governor's Association/Council of Chief State School Officers' Common Core Standards Initiative were focusing much more explicitly on this area and that focus may have changed the effects of focal and control variables on state policymaking. Additionally, the federal government's School Improvement Grants program, while linked to RTTT in that states were encouraged to intertwine their SIG initiatives with their RTTT plans, may have altered states' school improvement related policymaking. Of the three policy areas, teacher policy was the most explicitly linked to RTTT. While there had been increasing attention to teacher policy prior to RTTT, the attention given to teachers throughout the RTTT final guidance focused states on this policy area, as suggested by the vignettes about state policymaking in the previous chapter. This focus seems to have intensified after the release of final federal guidance in May 2009. As such, I begin with the results of the piecewise linear growth model for teacher policy.

A caution about the preciseness of the number attached to the dependent variable and to coefficients and their interpretation is warranted. "Policy distance" is, without context, difficult to interpret and in the following sections the emphasis is on the significance of the predictor and the sign of the coefficient as these capture both the statistical importance of the predictor and the effect it has on state policymaking, either decreasing state policy distance (a negative coefficient), i.e. representing increasing policy similarity across the states in the dyad, or increasing state policy distance (a positive coefficient), i.e. suggesting that the policies of the states in the dyad are diverging. In some cases, as described in Chapter 3, variables capture the characteristics of either the policy adopting state in the dyad, the A state, or the state in the dyad towards which the adopting state could have moved its policies, the B state. For A state variables, the coefficient can be interpreted as "the higher the adopting state on this characteristic, the more likely their policy moved towards other states' policies (the coefficient has a negative sign) or away from other states (the coefficient has a positive sign)." For B state variables, the coefficient can be understood as "the higher the state on this characteristic, the more likely states are to move towards its policies (the coefficient has a negative sign) or away from its policies (the coefficient has a positive sign)."

Finally, I present the model used for the analysis, as shown in Chapter 3. The full model and the results for all three models presented in a table can be found in Appendix H:

Level 1:

State Dyad Policy Distance = $\pi_{00} + \pi_{10}$(Time 1 [March 2009 – November 2009])$_i$ + π_{20} (Time 2 [December 2009 – August 2010])$_i$ + e_{0i}

Level 2:

$\pi_{00} = \beta_{00}$ (Intercept) Initial status
+ β_{004} Difference in state ideology [A & B])$_i$
+ β_{006} (Unified Republican government [A & B])$_i$ + β_{007} (Unified Democratic government [A & B])$_i$
+ β_{008} (Teachers' union contributions, per student [A])$_I$
+ β_{012} (Round 1 winner [B])$_i$ + β_{013} (Gates "frontrunner" state [B])$_I$
+ β_{014} (Elected CSSO [A])$_i$

$$\sum_{q=1}^{Q_0} \beta_{0q} X_{qi} + r_{0i}$$

$\pi_{10} = \beta_{100}$ (Intercept) Growth Time 1
+ β_{104} (Difference in state ideology [A & B])$_i$
+ β_{106} (Unified Republican government [A & B])$_i$ + β_{107} (Unified Democratic government [A & B])$_i$
+ β_{108} (Teachers' union contributions, per student [A])$_i$
+ β_{112} (Round 1 winner [B])$_i$ + β_{113} (Gates "frontrunner" state [B])$_i$
+ β_{114} (Elected CSSO [A])$_i$

$$+ \sum_{q=1}^{Q_1} \beta_{1q} X_{qi} + r_{1i}$$

$\pi_{20} = \beta_{200}$ (Intercept) Growth Time 2
+ β_{204} (Difference in state ideology [A & B])$_i$
+ β_{206} (Unified Republican government [A & B])$_i$ + β_{207} (Unified Democratic government [A & B])$_i$
+ β_{208} (Teachers' union contributions, per student [A])$_i$
+ β_{212} (Round 1 winner [B])$_i$ + β_{213} (Gates "frontrunner" state [B])$_i$
+ β_{214} (Elected CSSO [A])

$$+ \sum_{q=1}^{Q_2} \beta_{2q} X_{qi} + r_{2i}$$

5.2.1 Teacher policy

Results for the unconditional model, with no predictors entered at level-2, suggest that there was significant variance across states in policy distance and that this significant variance continued across time periods. Both the level 1 intercepts and variance of level 2 slopes continued to be significant in the final model ($r_{0i(un)}$=0.274, $p \leq 0.001$, $r_{0i(full)}$=0.249, $p \leq 0.001$; $r_{1i(un)}$=0.032, $p \leq 0.001$, $r_{1i(full)}$=0.026, $p \leq 0.001$; $r_{2i(un)}$=0.104, $p \leq 0.001$, $r_{2i(full)}$=0.65, $p \leq 0.001$). Between the unconditional and final models, variance in the intercept was reduced by 9 percent (0.274-0.249/0.274), variance in the slope of distance in Time 1 was reduced by 19 percent (0.032-0.026/0.032), and, of particular interest, the variance in the slope of distance in Time 2 was reduced by 38 percent (0.104-0.065/0.104).

5.2.1.1 States' teacher polices at the start of the competition

As of the first time point, March 2009, a number of variables significantly explained distances between states' teacher policies and many of these significant relationships are consistent with findings from prior diffusion research. States with higher levels of legislative professionalism had policies that were significantly different than policies of other states, β_{05}=0.787, se=0.174, $p \leq 0.001$. The larger the distance between states' ideology index scores, the more distance between states' teacher policies, β_{04}=0.005, se=0.002, $p \leq 0.001$. And the greater the difference between states' per capita income, the closer their policies, which may be suggestive of the tendency of small states to move towards the policies of larger states, β_{02}=-0.00002, se=0.000005, $p \leq 0.001$. However, at the initial time point, states pairs that had unified governments under Republican or Democratic control tended to have policies that were more distant, β_{06}=0.498, se=0.161, $p \leq 0.05$ and β_{07}=0.101, se=0.060, $p > 0.05$, respectively, though only

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the effect of *Unified Republican government (A & B)* was significant. It may be that the ideological context in a state matters more than political party when legislators make teacher policy.

Of the focal variables, there was a significant finding for the effect of teachers' union political contributions, though not in the expected direction. States where teachers' unions donated more to political campaigns and lobbying efforts, standardized by the state's K-12 enrollment, had teacher policies that were significantly closer to those other states, though the effect does not appear to be large, β_{08}=-0.010, *se*=0.005, *p*≤0.05. Though this was not predicted, there are a number of explanations for this finding. For example, it may have been that states with more politically active teachers unions had pushed for some of the less contentious policy components, e.g. state support for professional development, earlier than had other states. Further, while teachers' unions have resisted some elements of teacher evaluations they perceive to be punitive or unfair such as the inclusion of student growth in teacher evaluations or the dissolution of tenure protections, they have not categorically opposed all statewide evaluation systems. The indicator for Right to Work state was not significant, further supporting the idea that factors other than union strength may have exerted more influence on state policy prior to RTTT.

Finally, it is also important to note the lack of significance of the variables representing the status of policy "sending" states in dyads as Gates Foundation selected frontrunner states or Round 1 Winners, suggesting that, at the start of the competition, these states' policies were not significantly more likely to be emulated by other states.

5.2.1.2 States' teacher policy change in Time 1, March 2009 through November 2009

While states' relative policy distance and the factors related to that distance were, for the most part, as we would expect at the start of the RTTT competition, prior to the release of federal program guidance, states' policy adoption decisions were much more unpredictable. Overall, during this time period, state policies were diverging, β_{10}=0.557, se=0.064, $p \leq 0.001$, suggesting that, though states were adopting teacher policy, they were not consistently adopting similar policies. *Difference in per capita income (A & B)*, which was significant at the initial time point, was highly insignificant, but *State population ratio (A & B)*, which was not significant at the start, had a significant negative relationship with the policy distance outcome measure, β_{11}=-0.004, se=0.002, $p \leq 0.05$, indicating that the more different in population size states were, the more likely they were to adopt policies from one another. Similarly, the coefficient for *Difference in state ideology* was negative, β_{14}=-0.003, se=0.0009, $p \leq 0.001$; the more different states' ideology, the more likely they were to have adopted policies from one another during this time period. We see similar patterns of relationships that were positive at the start of the competition reversing during this time period for *Legislative professionalism (A)*, β_{15}=-0.299, se=0.106, $p \leq 0.01$, *Unified Republican government (A & B)*, β_{16}=-0.166, se=0.046, $p \leq 0.001$, *Unified Democratic government (A & B)*, β_{17}=-0.139, se=0.027, $p \leq 0.001$.

Variables related to internal political forces specific to education yielded several significant results. States that had elected Chief State School Officers were more likely to adopt policies similar to those in other states, as compared to CSSOs who were appointed by either the Governor or the state Board of Education, β_{114}=-0.086, se=0.024, $p \leq 0.001$. It may have been that an elected CSSO saw more political benefit in pushing legislators to move quickly on RTTT-

related teacher policies. However, variables capturing the strength of teachers' unions were significant but mixed. States were more likely to adopt policies more similar to those in states that had right to work laws, β_{19}=-0.102, se=0.025, $p \leq 0.001$, suggesting that states may have been adopting policies from states that had less union friendly laws during this time period. However, the amount of teachers unions' contributions to campaigns and lobbying appeared to have some effect, as states with higher per student spending by teachers' unions were less likely to adopt laws similar to those in other states, β_{18}=0.008, se=0.003, $p \leq 0.01$.

Finally, indicators capturing the tendency of other states to adopt policies similar to those in the frontrunner and first round RTTT winners remained insignificant, as would be expected given the prediction that the influence of these states' policies would increase in the later part of the competition.

5.2.1.3 States' teacher policy change in Time 2, December 2009 through August 2010

During the later part of the period under examination, states returned to adoption patterns observed at the beginning of the competition, reversing the directions of coefficients observed in Time 1 and largely conforming to findings from prior diffusion research. More notably, the intercept of the slope of Time 2, the mean change in state policy distance over this time period, shows states moving significantly and somewhat dramatically towards other states' policies, β_{20}=-0.875, se=0.120, $p \leq 0.001$. These findings suggest that, though states were making adoption decisions for teacher policies consistent with expectations, they were also very quickly converging around a set of policy components. The exception to this was for states with elected

CSSOs, which moved slightly less towards other states' teacher policies than states with appointed CSSOs, β_{214}=0.153, se=0.049, $p\leq0.01$.

The mixed significant findings for the effect of teacher union strength held in Time 2. While states tended to move away from the policies in states that had right to work laws, β_{29}=0.225, se=0.050, $p\leq0.001$, the buffer of teachers' union spending against the general trends towards more stringent teacher policies appears to have weakened in Time 2, β_{28}=-0.013, se=0.005, $p\leq0.05$. The mixed findings may be the result of state-level political processes. For example, in Colorado, not a right to work state, teachers' unions mounted a significant lobbying campaign to prevent passage of state legislation weakening tenure rules and requiring student growth to be used as part of teacher evaluations; the bill ultimately passed (Banchero, 2010). Meanwhile, in Georgia, a right to work state, the state teacher association successfully lobbied to keep the Governor's teacher evaluation legislation from coming to a full vote and the bill died in committee (Torres, 2010).

Perhaps the most interesting significant findings are for the *Gates "frontrunner" (B)*, β_{213}=-0.106, se=0.044, $p\leq0.05$, and *Round 1 winner (B)*, β_{212}=-0.317, se=0.085, $p\leq0.001$, indicator variables, both of which had been insignificant at the start of the competition and through Time 1. Over the second time period, other states significantly moved towards the states in which policies were perceived to be or actually were favored by the U.S. Department of Education. States' move towards Tennessee's and Delaware's teacher policies is particularly important, providing evidence that once federal preferences were clearly expressed through their selection as Round 1 winners, other states adopted polices more similar to theirs. As a check of the robustness of these findings, I ran a state fixed effects model to control for the idiosyncrasies of individual state's policymaking processes; while all other significant effects disappeared in

this model, the effects of *Round 1 winner (B)*, $\beta_{212(fe)}=-0.357$, *se*=0.009, *p*≤0.001, and the pattern of policy divergence in Time 1, $\beta_{10(fe)}=0.315$, *se*=0.032, *p*≤0.001, followed by a narrowing of policy distance in Time 2, $\beta_{20(fe)}=-0.667$, *se*=0.322, *p*≤0.05, remained significant.

In the teacher policy area, there were several notable findings, most generally in the general directions of state policymaking over the course of the grant, which indicated a divergence of state policy during the first time period followed by a sharp convergence during the second time period. These effects remained significant even in the state fixed effects models. Additionally, the changes in the signs of the coefficients across time periods is notable because it suggests, in line with prior vertical diffusion research, that clearer information about federal preferences impacted the effects of states' demographic, economic, and political characteristics. While state policymaking appeared somewhat haphazard in Time 1, states more closely conformed to expected diffusion patterns in Time 2. The influence of federal preferences is most evident in the effects for *Round 1 winner (B)* and *Gates "frontrunner" (B)*, both of which indicate that other states were adopting policies similar to those in states who had either won a grant or believed to be most in line with federal preferences.

5.2.2   College and career readiness policy

Broadly, the results for the college and career readiness policy model suggest that states were, over the course of the competition, generally adopting similar policies. And while the set of variables for teacher policy showed significant effects for a number of variables in the model and explained almost 40 percent of the variance in the intercept of the slope for Time 2, I did not find similar results in the teacher policy area. A comparison of the variance components in the unconditional and final models suggests that while the final model reduced the variance of initial

status by 12 percent, ($r_{0i(un)}$=1.744, $p\leq0.001$, $r_{0i(full)}$=1.535, $p\leq0.001$), and the variance in the slope for Time 1 by 13 percent, ($r_{1i(un)}$=0.053, $p\leq0.001$, $r_{1i(full)}$=0.046, $p\leq0.001$), there was slightly more variance in the intercept of Time 2, ($r_{2i(un)}$=0.193, $p\leq0.001$, $r_{2i(full)}$=0.201, $p\leq0.001$), and no change in level-1 error, ($e_{0i(un)}$=0.053, $e_{0i(full)}$=0.046). This is, perhaps, reflective of a number of issues specific to this model, (the model was built to best model teacher policy), and, broadly, to the college and career readiness policy area. Since the mid-2000s this policy area has attracted the attention of non-governmental groups (e.g. Achieve) and foundations (e.g. the Gates Foundation), and there are many variations in the relationship between K-12 and post-secondary institutions across states (e.g. New York's model that unifies K-12 and post-secondary governance). As would be expected, the state fixed effects model explains more variance, 63 percent of the variance in initial status, 66 percent of the variance in the slope of Time 1, and 87 percent of the slope in Time 2. However, the variance in initial status, distance rate in Time 1, and distance rate in Time 2 continue to be significant in the state fixed effects model.

5.2.2.1   States' college and career policies at the start of the competition

Nonetheless, there were some significant effects for the initial status and across the two time periods. *State population ratio* was significant, β_{01}=-0.024, *se*=0.007, $p\leq0.01$, indicating that as states' population ratio increased, their policies were more similar. And as states' legislative professionalism increased, their policies were somewhat dramatically more distinct from other states, β_{05}=2.166, *se*=0.009, $p\leq0.001$. (The intercept for initial status was β_{01}=2.972, *se*=0.239, $p\leq0.001$.) The effect of *Percent of local school funds from state (A)* was significant, β_{010}=-0.12, *se*=0.004, $p\leq0.001$, and indicates that the more states contributed to the operations of their local schools, a proxy for the influence of state policymakers on local schools, the more similar the

state's policies to those in other states. The effect of an elected CSSO was also negative and significant, β_{14}=-0.569, *se*=0.098, $p\leq0.001$. None of the political or ideology variables were significant.

Effects for the variables related to union strength were similarly mixed. The effects for both *Right to work state* and *Teachers' union contributions, per student (A)* were significantly positive, β_{07}=0.054, *se*=0.009, $p\leq0.01$ and β_{08}=0.338, *se*=0.105, $p\leq0.001$, respectively. While these results may seem inconsistent, in the context of college and career readiness policy, there may be plausible explanations. College and career readiness policy includes policies such as requirements for end-of-course and high school exit exams which may be both opposed by teachers unions, as they add to the testing regimen in schools. Right to work states may be less likely to be emulated by non-right to work states in policy areas that overlap with workforce policy, such as college and career readiness policy.

Finally, states that were designated as recipients of the first round of Gates RTTT application assistance funding had policies that were significantly distant from other states, β_{013}=0.353, *se*=0.099, $p\leq0.001$. Given the Gates Foundation's attention to college and career readiness, it is likely that these states had passed more college and career readiness policies prior to the start of the competition, which played a role in their selection by Gates to receive grants.

5.2.2.2 States' college and career policy change in Time 1, March 2009 to November 2009

The effects in the state policy change trajectory for Time 1 were, generally, very similar to the effects observed at the start of RTTT. Though the intercept was not significant, β_{20}=-0.133, *se*=0.0069, *p*>0.05, the sign of the coefficient suggests a general trend towards convergence. The effect of *State population ratio* suggests that during this time period, states were adopting

policies similar to states of similar sizes; as the difference in the populations of the states in the dyad increased, their policies diverged, β_{011}=0.008, se=0.002, $p\leq0.001$. States' economic health also had an impact on state policymaking during this time period, β_{111}=-0.007, se=0.003, $p\leq0.05$, as states with a greater increase in their general revenues were more likely to adopt policies similar to those in other states.

The variables capturing shared political party governing strength were also significant during this time period. While states that were governed by Republicans were adopting policy from other Republican dominated states, β_{16}=-0.141, se=0.057, $p\leq0.05$, states governed by Democrats were not adopting policies from similarly Democratically-controlled states, β_{017}=0.130, se=0.037, $p\leq0.001$. Interestingly, in the state fixed effects model, the coefficient for *Unified Republican governments (A & B)* is negatively signed but is no longer significant, $\beta_{15(fe)}$=-0.143, se=0.092, $p>0.05$, while the effect for *Unified Democratic governments (A & B)* continues to be significant but indicates that states governed by Democrats are adopting policies similar to those in states also controlled by Democrats, $\beta_{16(fe)}$=-0.94, se=0.045, $p\leq0.05$. This suggests that a few states may be having a large impact on this coefficient, which is decreased once I control for them in the fixed effects model.

Similar to the effects observed at the start of the competition, the effects of *Percent of local school funds from state (A)* and *Teachers' union contributions, per student (A)*, continue to be positive and significant, β_{110}=0.007, se=0.003, $p\leq0.05$ and β_{18}=0.006, se=0.002, $p\leq0.01$. *Right to work state (B)* is not significant in the model without state fixed effects, β_{19}=0.031, se=0.028, $p>0.05$, but is positive and significant in the fixed effects model, $\beta_{18(fe)}$=0.094, se=0.038, $p\leq0.05$.

Finally, the effect of a state having an elected Chief State School Officer is no longer significant, β_{114}=-0.003, se=0.003, p>0.05. However, states are adopting policies more similar to those in *Gates "frontrunner" state (B)*, β_{113}=-0.062, se=0.027, $p\leq0.05$. The effect of Gates selection is somewhat difficult to attribute in the context of college and career readiness policies, as alluded to above; these states were selected, in part, for their college and career readiness policies, so it may be that other states would have been moving towards their policies regardless of their Gates selection simply because they had more established policies in this area. The effect of this variable remains negatively signed in the state fixed effects model but it is no longer significant, $\beta_{112(fe)}$=-0.020, se=0.027, p>0.05.

5.2.2.3   States' college and career policy change in Time 2, December 2009 to August 2010

The intercept of the slope in Time 2 supports the theory that over the course of the first two rounds of RTTT, states' college and career readiness policies were, generally, converging, β_{113}=-0.062, se=0.027, $p\leq0.05$. The coefficient for *State population ratio* also suggests that states were adopting policies from states with larger population size differences, β_{21}=-0.022, se=0.006, $p\leq0.001$, in contrast to the positive sign for this coefficient in Time 1. The only other significant effect in Time 2 is for *Right to work (B)* which is also negatively signed, suggesting that, unlike in Time 1 and at the start of RTTT, states are adopting college and career readiness policies more similar to those in right to work states over the course of the second half of the competition, β_{29}=-0.299, se=0.114, $p\leq0.01$. The negative effect for *Right to work (B)* holds in the state fixed effects model, $\beta_{28(fe)}$=-0.235, se=0.089, $p\leq0.05$. While not significant in the model without state fixed effects, *Difference in state ideology* is significant during Time 2 in the state fixed effects

model, β_{23}=0.008, se=0.003, $p{\le}0.01$; this suggests that as the difference in states' ideology increases, their polices are diverging.

The results for the college and career readiness policy area, while not as dramatic as those in the teacher policy area, suggest that, across states, there is a general convergence towards similar college and career readiness policies. Further, the explicit attention to this policy area from external groups, such as the Gates Foundation or Achieve, may have had more impact on states than the more implicit emphasis given to college and career readiness in the Race to the Top competition, particularly as this area competed for attention with more prominent teacher policy concerns. In this respect, it is notable that while the effect of the Round 1 winners was significant in Time 2 in teacher policy, it was not significant either in the model for initial status or for the distance rates during Time 1 or Time 2. Additionally, the results from the model when interpreted with the results of the state fixed effects model point to the wide variation in both K-12 schools and post-secondary education systems across states. It is possible that in order to see clear effects for RTTT, the federal guidance would have had to addressed both states' K-12 and post-secondary institutions. Impacting post-secondary institutions could be particularly difficult because in most states even public post-secondary systems are governed separately from the public K-12 system.

5.2.3   Persistently lowest achieving schools policy

From March 2009 through August 2010, states' policymaking patterns for low achieving schools policies followed a trend similar to that observed for teacher policy, a general divergence during the first time period followed by a tendency toward policy convergence in the second time period. However, there was less distance between state policies at the start of the competition

than in the other policy areas examined in this study. The model, while yielding interesting results, explained only 3 percent of the variance in states' initial status ($r_{0i(un)}$=0.307, $p \leq 0.001$, $r_{0i(full)}$=0.299, $p \leq 0.001$), 13 percent of variance the distance rate in Time 1 ($r_{0i(un)}$=0.070, $p \leq 0.001$, $r_{0i(full)}$=0.064, $p \leq 0.001$), 10 percent of the variance of the distance rate in Time 2 ($r_{0i(un)}$=0.279, $p \leq 0.001$, $r_{0i(full)}$=0.279, $p \leq 0.001$), and none of the level-1 variance.

5.2.3.1 States' persistently lowest achieving schools policy at the start of the competition, March 2009

As stated above, as of March 2009, states persistently lowest achieving schools policy was more similar than in the other policy areas–$\beta_{00(pla)}$=2.149 se=0.111, $p \leq 0.001$ for lowest achieving schools policy, $\beta_{00(ccr)}$=2.972, se=0.239, $p \leq 0.001$ for college and career readiness policy, and $\beta_{00(tp)}$=3.17, se=0.103, $p \leq 0.001$ for teacher policy. This similarity is, in part, a product of the attention to underperforming schools as a result of ESEA Title I/No Child Left Behind Act (NCLB) and other non-competitive federal grant programs to states (i.e. School Improvement Grants) that had generally prescribed or encouraged a set of interventions. The most state variability was on indicators such as whether state laws allowed state takeover of schools, permitted contracting with charter management organizations, rewarded high performing schools, or financially penalized low performing schools. These issues, often politically contentious, involving debates about charter schools and local control of schools, appear to have played a role in many of the significant effects observed initially. *Difference in state ideology* was positive and significant, β_{04}=0.024, se=0.007, $p \leq 0.01$, indicating that the more distance in states' ideology scores, the greater the distance in their policies. If both states in the dyad were controlled by Democratic governors and legislatures, the states were less likely to have similar policies, β_{07}=0.118 se=0.096, $p \leq 0.05$.

Further supporting the idea that political concerns were prominent in state adoption decisions, *Elected CSSO (A)* was also positive and very significant, β_{014}=0.170, *se*=0.047, $p\leq0.001$. States that had a Chief State School Officer subject to election were significantly less likely to have persistently lowest achieving schools policies similar to those in other states. The finding for elected CSSO remained significant in the state fixed effects model, $\beta_{014(fe)}$=0.246, *se*=0.085, $p\leq0.01$.

Finally, the effect of *Round 1 winner (B)* is significant at the start of the competition, β_{012}=0.186, *se*=0.096, $p\leq0.05$. While this result would seem intriguing, it is, most likely, more reflective of those states' charter school laws and state takeover laws (both states had a charter school law, but neither had legislated provisions for state takeover) than of the policymaking tendencies of other states. This effect remains significant in the state fixed effects model that uses Pennsylvania, a state with charter laws and state takeover provisions, as the reference, $\beta_{01(fe)2}$=-0.411, *se*=0.186, $p\leq0.05$, $\beta_{Delaware(fe)}$=0.298, *se*=0.149, $p\leq0.05$, $\beta_{Tennessee(fe)}$=0.805, *se*=0.201, $p\leq0.001$.

5.2.3.2   States' persistently lowest achieving schools policy change, March 2009-November 2009

The relative stability of states' persistently lowest achieving schools policies is reflected in the lack of significance of the intercept for the distance rate at Time 1, β_{10}=0.148, *se*=0.089, $p>0.05$. States' ideological differences are no longer significant, but difference in state population ratio is significant during Time 1, β_{11}=-0.007, *se*=0.003, $p\leq0.05$, an indicator that states were adopting policies from states with different population sizes. However, there is some indication that political concerns continue to play a role in state policymakers' decisions, as *Elected CSSO* is significant, β_{114}=-0.213, *se*=0.042, $p\leq0.001$, suggesting that states with elected state school

officers were more likely to be adopting policies similar to those in other states. Similarly, the effect of *Round 1 winner (B)* was significant and negatively signed, β_{112}=-0.148, *se*=0.039, $p{\leq}0.001$. As stated above, the effect of these states charter school laws and, at least during this time period, lack of legislation providing for state takeover may be the reason for this result. Prior to the release of final federal guidance, there was significant attention to the perception that the draft federal guidance overemphasized the role of charter schools for school (c.f. Klein, 2009; McNeil, 2009c) and states responded accordingly. Again, the fixed effects model appears to support this theory.

5.2.3.3 States' persistently lowest achieving schools policy change, December 2009 through August 2010

Though the sign of the coefficient for the slope intercept in Time 2 is negative, in contrast to the positive sign in Time 1, the coefficient is similarly small and insignificant, β_{20}=-0.069, *se*=0.215, $p{>}0.05$. The most significant result In Time 2 is for *Legislative professionalism (A)*, β_{25}=-0.225, *se*=0.081, $p{\leq}0.01$, which suggests that states that had more professional legislatures were passing policies more similar to other states during this time period. A number of reasons may explain this result. Other states with less legislative capacity had focused their policymaking efforts on other areas, while larger legislatures may have been better able to continue to make policy in this area, which would be consistent with diffusion theory. Alternately, larger states tend to have both more professional legislatures and larger numbers of persistently lowest achieving schools, and the larger number of schools subject to oversight in this policy area may have led to delays in passage of legislation.

Elected CSSO (A) remains significant in Time 2, β_{114}=0.406, *se*=0.087, $p{\leq}0.001$, though the sign of the coefficient is positive, in contrast to Time 1, but in keeping with the positive

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effect of the variable at the start of the competition. This result can be plausibly understood in conjunction for the significant finding for *Round 1 winner (B)*, which also remains significant and reverses its sign in Time 2, β_{112}=0.274, *se*=0.099, *p*≤0.01. Both Tennessee and Delaware changed their policies to allow state takeover of persistently lowest achieving schools and, particularly in Tennessee, expanding the range of organizations that could take over schools in this time frame. It is important to remember that a positive coefficient for *Round 1 winner (B)* indicates that other states are moving away from Delaware and Tennessee's policies, while a positive coefficient for *Elected CSSO (A)* suggests that states with an elected Chief State School Officer are moving away from policies in other states. Taken together, and given the political contentiousness of state and non-governmental organizations' takeover of schools, elected officials may have been less inclined to adopt more locally intrusive policies and pointedly less likely to adopt policies with the level of intervention that Tennessee's allowed. The results for the state fixed effects model would appear to support the proposition that Tennessee's and Delaware's persistently lowest achieving schools policies were not widely adopted by other states, $\beta_{Tennessee(fe)}$=1.023, *se*=0.292, *p*≤0.001, $\beta_{Delaware(fe)}$=0.564, *se*=0.236, *p*≤0.05.

In summary, there was less distance between state policies at the start of the competition among states' persistently lowest achieving schools policy than in the other policy areas, and the results suggest policy decisions may have been driven less by the competition and more by normal policy cycles or the overarching political and policy environment. While states made changes to their policies, the bulk of these changes appeared to be driven by a need to conform to the federal requirements to receive School Improvement Grants, which were awarded in a non-competitive process starting in 2009, rather than by the Race to the Top completion. And while some states adopted more prescriptive and locally-intrusive policies, such as those in Tennessee

and Delaware that allowed for state takeover of schools and the creation of state-run school districts (Tennessee's Achievement School District) or externally-managed mini-districts (Delaware's Partnership Zones), not all states were willing to go beyond the minimum federal requirements. This was particularly true in states where the Chief State School Officer would be subject to statewide election.

5.2.4 Findings across teacher, college and career readiness, and persistently lowest achieving schools policy areas

In this section, I will examine the findings across the three policy areas, returning to the research questions and hypotheses proposed in Chapter 3 and presenting related findings. In the figures presented in this section, it may be helpful to remember that a positive slope indicates increasing policy distance across states, while a negative slope indicates increasing policy similarity. Further, a table displaying findings with shadings to indicate the direction of the slope and significance for variables can be viewed in Appendix H.2.

Broadly, I found the strongest support for the hypotheses in the teacher policy area, particularly for the impact of the release of final program guidance and for the effects of a states' selection as a RTTT Round 1 winner or as an initial recipient of a Gates Foundation application assistance grant. In addition, politics and political concerns appeared to play a role in states' policymaking behavior across the three policy areas, though not consistently in anticipated ways. Measures of teachers' unions appeared to have some influence over state policy trajectories, but union influence, or, at least, the impact of their political contributions, appears to have waned over the course of the competition. Nonetheless, states were not necessarily adopting polices from Right to Work states, suggesting that either Right to Work states passed teacher policies

similar to other states later in the competition or were not states to which other states looked for policy ideas, regardless of the role of their unions in policy decisions. Additionally, I found support for the effect of a state having an elected Chief State School Officer and interesting differences in the role of ideology and common governing political parties across states.

5.2.4.1   Findings for horizontal diffusion: Is there evidence that states adopted policy ideas from other states?

5.2.4.1.1   *Economic and demographic characteristics*

Across the three policy areas, findings do not strongly support the economic and demographic horizontal diffusion hypotheses; this is not necessarily a surprising result given the mixed and inconsistent significant findings in prior research (see Allen, Pettus, Haier-Markel, 2004; Grossback, Nichoson-Crotty, and Pettus) and, specifically, in research on the diffusion of education policies (see, for example, Mintrom and Vergari, 1998; Renzulli and Roscingo, 2005; Wong and Langevin, 2005, Doyle, 2006). States' difference in per capita income was a significant predictor only for initial status in teacher policy and it was highly insignificant as a predictor in Time 1 and Time 2 across policy areas[16]. Models using alternate forms of per capita income (e.g. *Per capita income in State B)* yielded similar findings. *Change in prior year general revenue in State A* suggests that states with the greatest increase in general revenue in the prior year were more likely to adopt teacher policies similar to those in other states during the first time period, but tended to move away from the policies of other states in the second time period. This indicator of states' economic health was also significant in Time 1 for college and

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[16] Difference in Per Capita income was not included as a predictor in final models in Time 1 or Time 2 for any of the three time periods

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career readiness policy, but not significant for persistently lowest achieving schools policy. Together, these suggest that state wealth may have played a somewhat small role in states' policy decisions. In persistently low achieving schools policy, less wealthy states may have been more willing to adopt these policies earlier, presumably to qualify for School Improvement Grant funding more quickly. And in teacher policy, wealthier states many not have been as willing to pass more far-reaching teacher policies to qualify for RTTT funding.

Finally, the results for *State population ratio* indicate that at the start of the competition the greater the difference in the size of states' populations, the more similar their policies. The tendency for states to adopt policies similar to those in states with differently sized populations held for Time 1 in teacher policy and persistently lowest achieving schools policy, but not for college and career readiness policy where, in Time 1, states appeared to be adopting policies similar to those in similarly sized states, as would be expected. The mixed directions of the coefficients for this variable across policy areas and time periods suggests that, at different points during the competition, states may have been more influenced by other factors in their policy decisions. In teacher policy, the findings for *State Population Ratio* taken together with the unexpected directions of coefficients for other covariates suggested by the diffusion literature may be indicative of somewhat illogical policy adoption decisions at a point when states wanted information about federal preferences but did not have clear indications. This is a plausible conclusion given the speed with which states passed policy in line with the more complete information available to them in Time 2.

Turning to education-related demographic and political characteristics, states' differences in the percent of adults over the age of 25 with a high school diploma also did not appear to have the expected impact. This measure was not significant across any time period for college and

career readiness, contrary to my prediction. It did appear to have an effect after the release of federal guidance in teacher policy; in Time 2, states tended to adopt policies similar to those in states with similar rates of adults with a high school diploma. A similar though not significant pattern of divergence in Time 1 followed by convergence in Time 2 is present in college and career readiness policy. The predictor seemingly had the opposite effect in persistently lowest achieving schools policy; these effects are not significant but the signs of the coefficient for *Difference in High School Diploma* suggest that states are adopting policies from states with more similar high school diploma rates in Time 1 and from states with more different high school diploma rates in Time 2. These inconsistent effects may be indicative of the influence of the School Improvement Grants on state persistently lowest achieving schools policy.

Percent of local school funds from the state in State A was not significant across any time period in persistently lowest achieving schools policy. The only significant effect for this proxy for local control of schools in teacher policy was in Time 2 and was, somewhat unexpectedly, positive. This suggests that states that supplied a greater percentage of local school funding were less likely to adopt policies similar to those in other states. That said, this measure may have been an inadequate proxy for local control. In some states, the state acts as a funding allocator and funds are not considered to be state revenue, and, thus, the percent of funds from the state may not be a good measure of the strength of local school systems in statewide policy adoption and implementation decisions.

5.2.4.1.2 States' political characteristics

State political characteristics appear to have wielded the greatest influence in teacher policy, perhaps not unexpectedly. The effects of a state having an elected, rather than appointed, chief state school officer across the three policy areas suggests that their electoral concerns may have

played a role in their state policy decisions. The *Elected CSSO* variable had the most consistently significant findings in the two more politically fraught policy areas–teacher policy and persistently lowest achieving schools policy. While states with an elected CSSO generally adopted policies similar to other states in Time 1, their states appeared to take a somewhat sharp turn away from other states in Time 2. As states with appointed CSSOs adopted more locally intrusive persistently lowest achieving schools policies and more prescriptive teacher policies, states with elected CSSOs chose to adopt less similar policies. CSSOs subject to statewide election may have been less willing to push lawmakers and state school boards to adopt policies unpopular with traditional education interests; these groups would more be likely have a greater impact on an election for an education official than for a state legislator or governor.
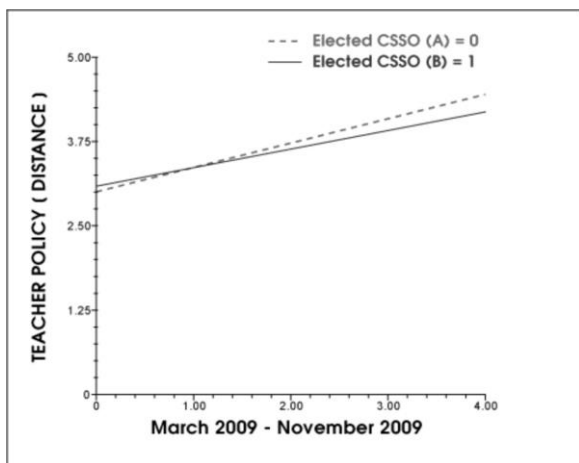

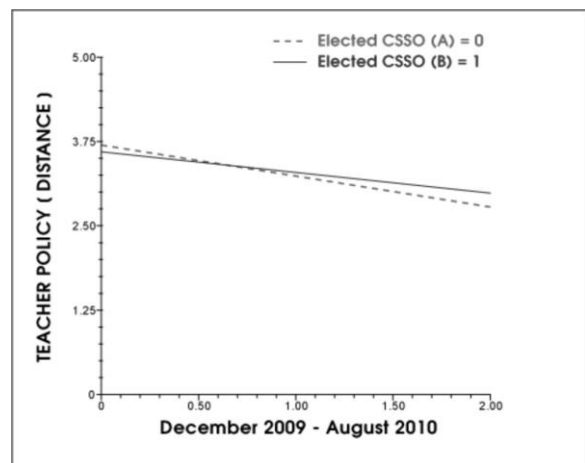**Figure 11. Elected and Appointed CSSO, Time 1, Teacher Policy**

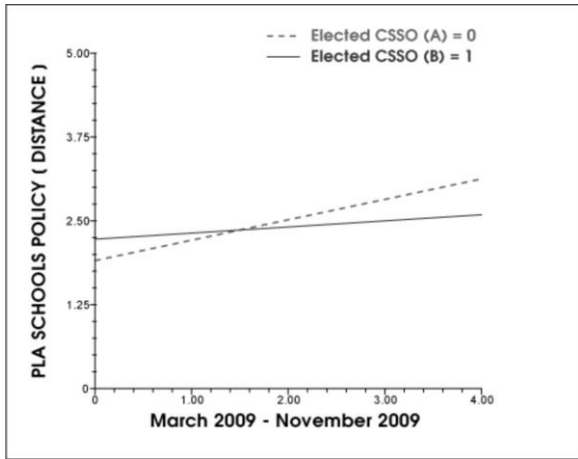**Figure 12. Elected and Appointed CSSO, Time 2, Teacher Policy**

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Figure 13. Elected and Appointed CSSO, Time 1, Persistently Lowest Achieving School Policy
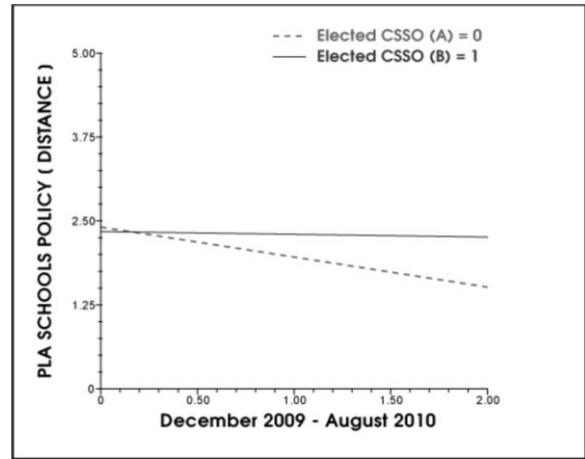

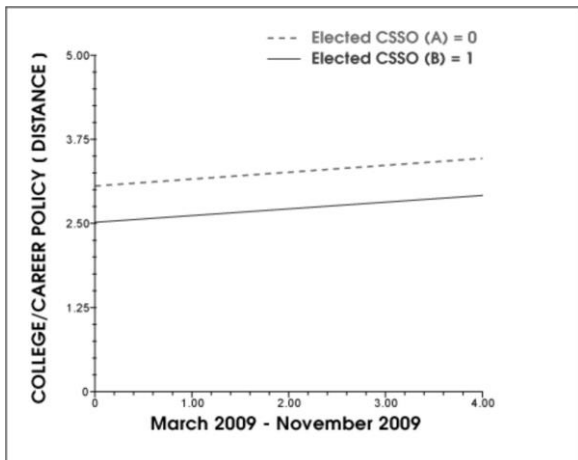**Figure 14. Elected and Appointed CSSO, Time 2, Persistently Lowest Achieving Schools Policy**

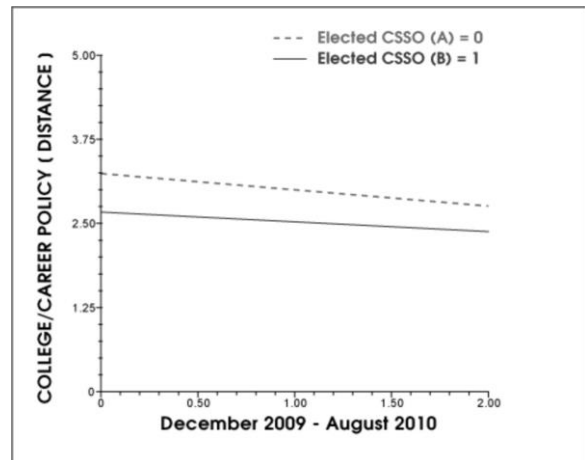**Figure 15. Elected and Appointed CSSO, Time 1, College and Career   Policy**

Figure 16. Elected and Appointed CSSO, Time 2,

While not significant in either college and career readiness policy or persistently lowest achieving schools policy, *Difference in State Ideology* was significant in the teacher policy area. The variables indicating shared political party across states were most significant in the teacher policy area. Though in Time 1 in college and career readiness policy Republican governments appeared to be adopting policy from other Republican governments and Democratic

governments were adopting policies that were less similar than those in states also controlled by Democrats, these effects were not as consistent in this policy area as they were for teacher policy. As discussed more extensively above, the seeming contradictions across the political variables in the teacher policy area, particularly for Democratic governments, may have been a product of the push for policies most often associated with ideological conservatives by a Democratic presidential administration.
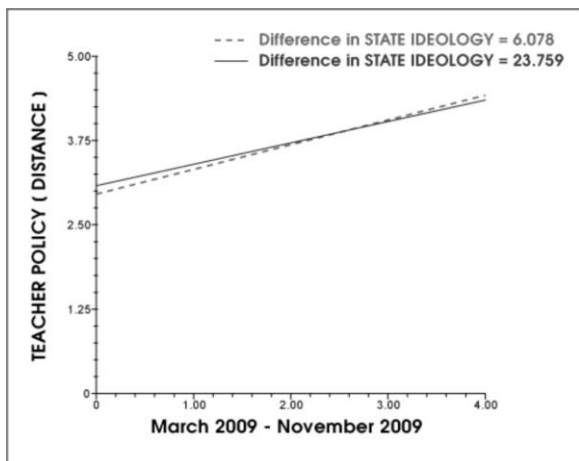

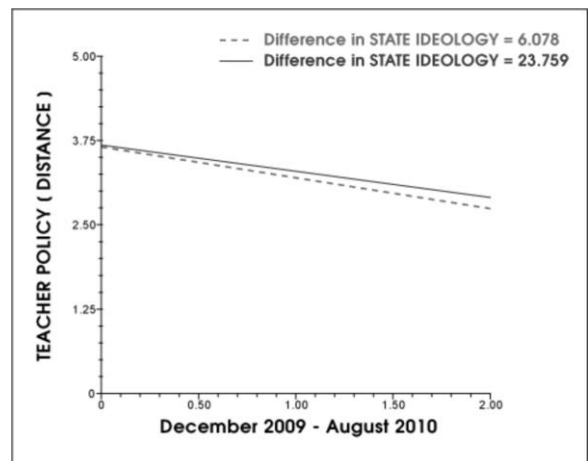**Figure 17. Difference in State Ideology, Time 1, Teacher Policy**

Figure 18. Difference in State Ideology, Time 2, Teacher Policy
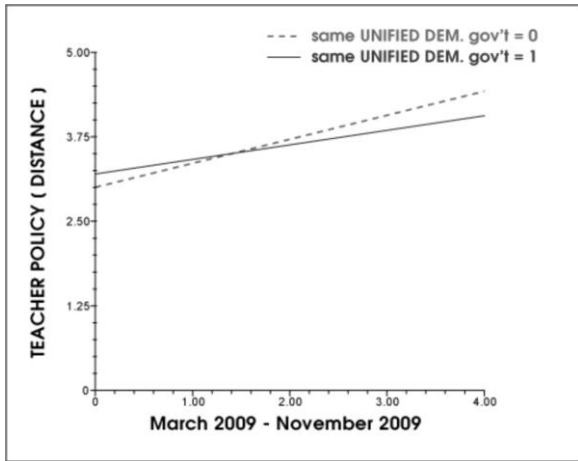
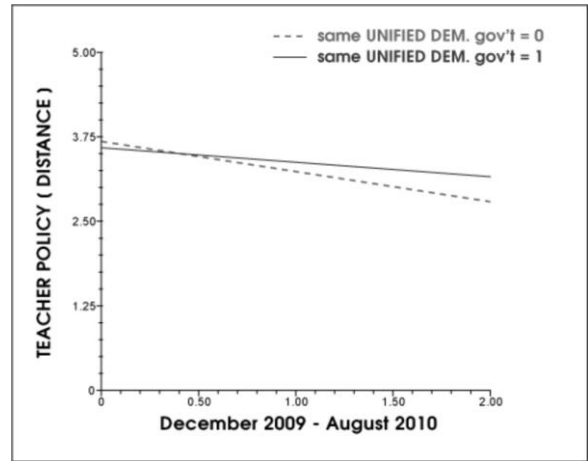**Figure 19. Unified Democratic governments, Time 1, Teacher Policy**

Figure 20. Unified Democratic governments, Time 2, Teacher Policy
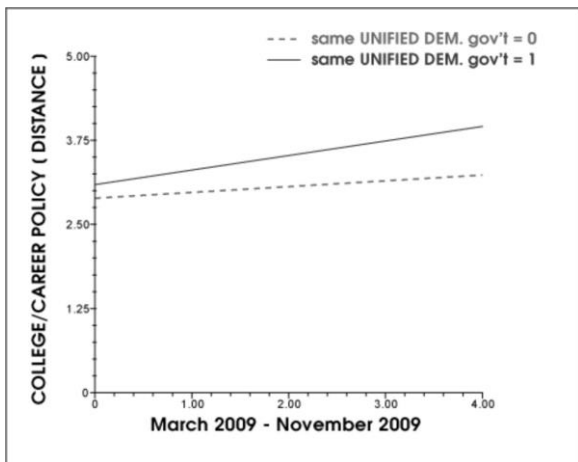

Figure 21. Unified Democratic governments, Time 1, College and Career Readiness Policy
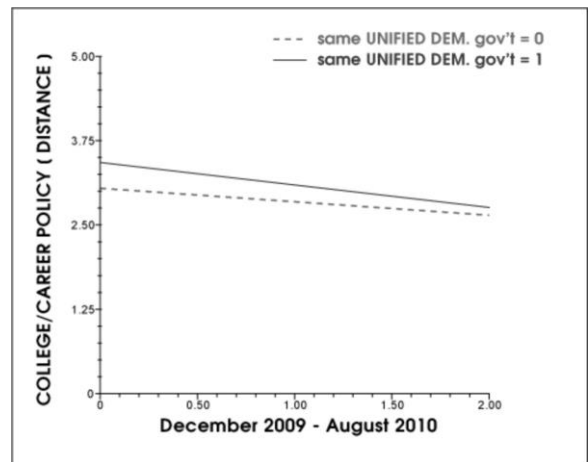
Figure 22. Unified Democratic governments, Time 2, College and Career Readiness Policy

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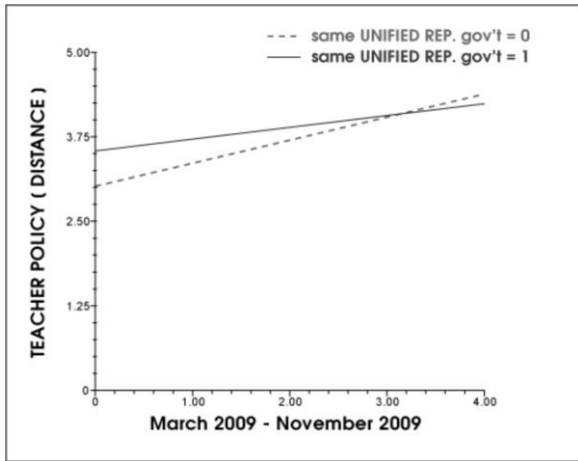
Figure 23. Unified Republican governments, Time 1, Teacher Policy
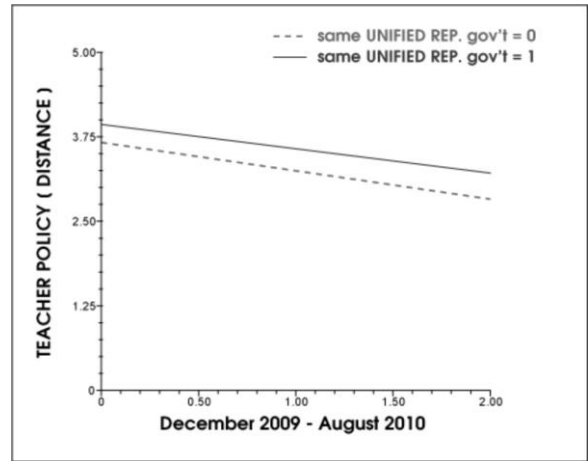
Figure 24. Unified Republican governments, Time 2, Teacher Policy
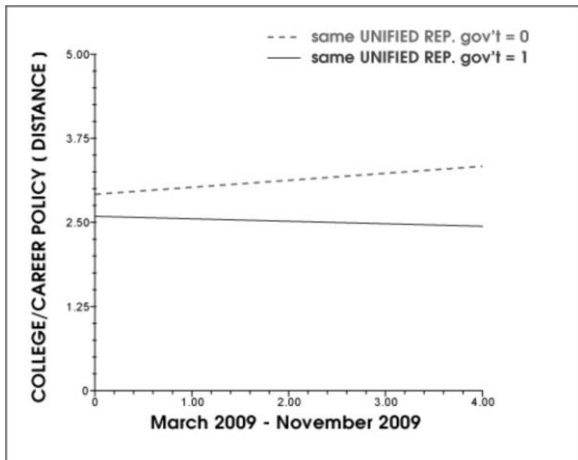
Figure 25. Unified Republican governments, Time 1, College and Career Readiness Policy
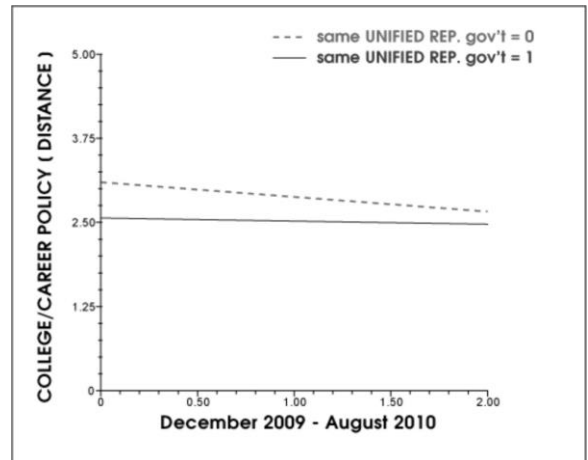
Figure 26. Unified Republican governments, Time 2, College and Career Readiness Policy

5.2.4.1.3 *Teachers' Union strength*

The effect of teachers union strength did not show consistent results across policy areas or time periods, as was anticipated. Increasing teachers' union spending in a state resulted in general, though not consistently significant, trend away from other states' college and career readiness

policies. Conversely, in persistently lowest achieving schools policy, the coefficients for teachers' union spending were negative, though insignificant, across time periods. As was expected, teachers' union spending was most significant in teacher policy. The impact, however, was unexpected. In the first time period, prior to the release of federal guidance, teachers union strength was associated with increasing policy distance; after the release of the guidance, the effect was reversed and states with higher levels of teachers' union political contributions move their teacher policies towards those of other states. Media reports from Oklahoma and Colorado in Chapter 4 support this result; particularly as the deadline for Round 2 approached, teachers unions were largely marginalized in state policy decisions in these states, which had higher levels of union per student political spending ($7.48 in Oklahoma, $12.71 in Colorado) than in Florida ($2.95), Minnesota ($1.59), or Georgia ($0.48).
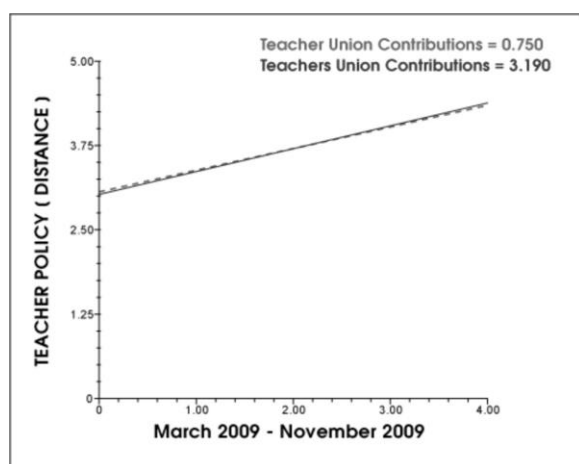
Figure 27. Teachers' Union contributions, Time 1, Teacher Policy
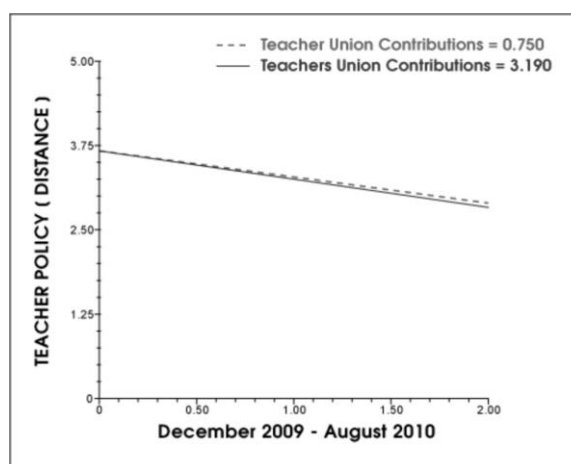
Figure 28. Teachers Union contributions, Time 2, Teacher Policy
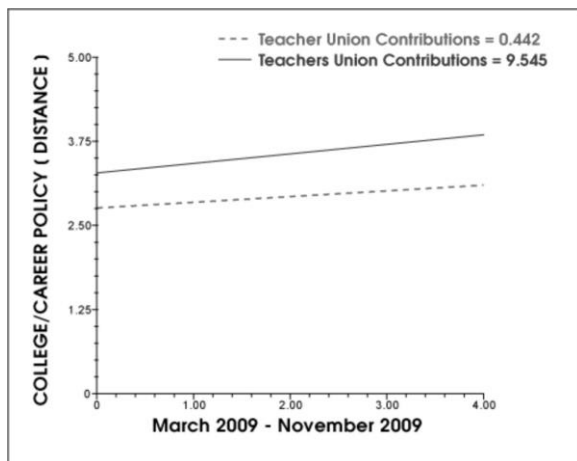
Figure 29. Teachers' Union contributions, Time 1, College and Career Readiness Policy
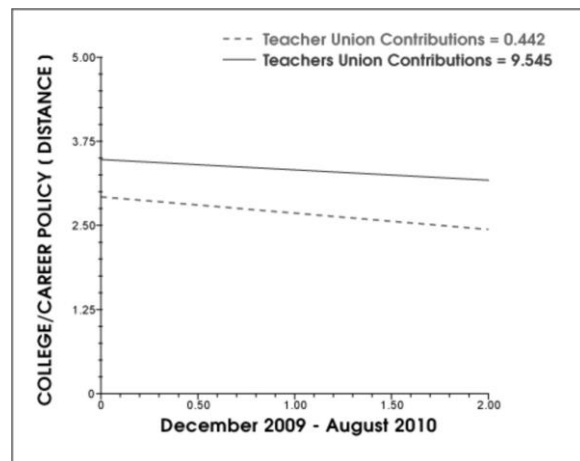
**Figure 30. Teachers' Union contributions, Time 2, College and Career Readiness Policy**

Nonetheless, states did not appear to be more likely to adopt teacher policies similar to those in right to work states. The effect of *Right to Work (State B)* was positive and significant in both college and career readiness and persistently lowest achieving schools during Time 2, suggesting that states were generally moving towards states with right to work laws in all policy areas other than teacher policy. It is possible that this is a product of the right to work laws themselves; states with protected collective bargaining processes may have been less likely to adopt policies from right to work states that would conflict with existing laws. This constraint would not have been as salient in the other two policy areas.

5.2.4.1.4   *Frontrunner states and Round 1 winners*

Perhaps the most surprising result for the variables indicating whether the second state in the dyad was either an initial selection to receive Gates Foundation application assistance funding or a Round 1 Winner was not that other states looked to these states for teacher policy in the second

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half of the competition, but rather that they did so rather dramatically. Though *Round 1 Winner (State B)* was unexpectedly significant in persistently lowest achieving schools policy, as discussed above, and *Gates Frontrunner State (State B)* was significant, as could be expected, in the first time frame for college and career readiness policy, the effect was not as notable as for teacher policy.
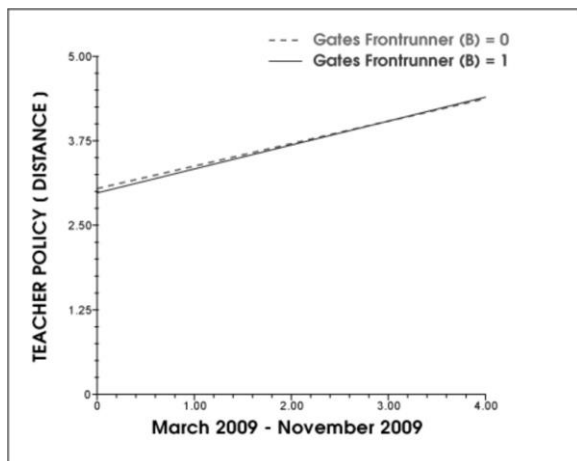
Figure 31. Gates frontrunner state, Time 1, Teacher Policy
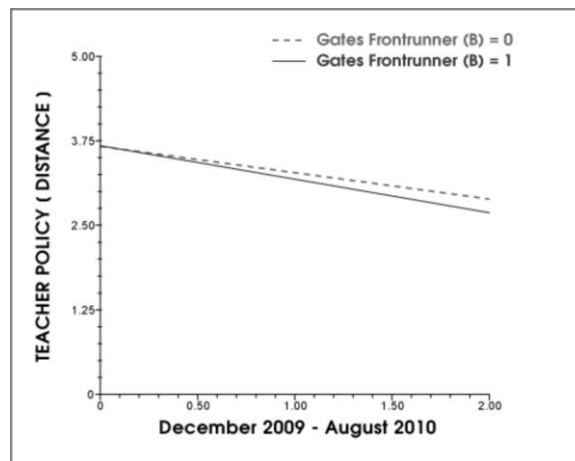
Figure 32. Gates frontrunner state, Time 2, Teacher Policy
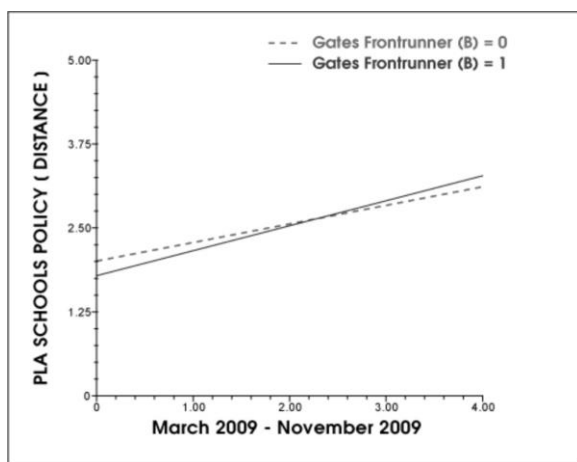
Figure 33. Gates frontrunner state, state fixed effects model, Time 1, Persistently Lowest Achieving Schools Policy
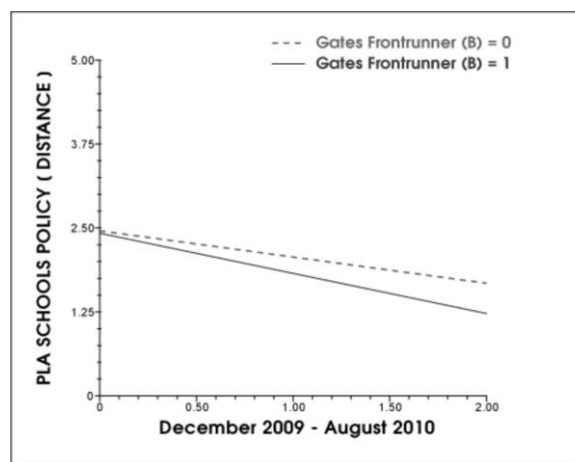
Figure 34. Gates frontrunner state, state fixed effects model, Time 2, Persistently Lowest Achieving Schools Policy

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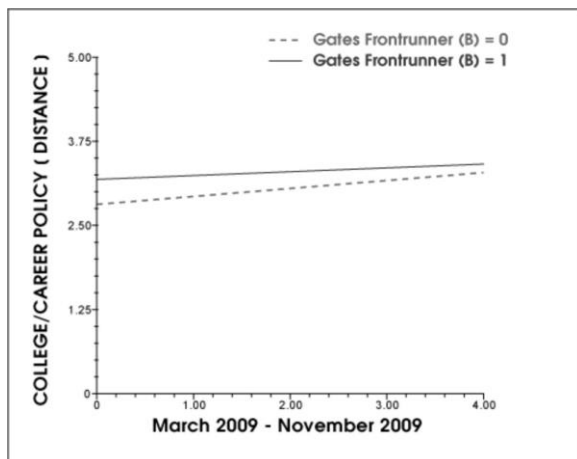
**Figure 35. Gates frontrunner state, Time 1,
College and Career Readiness Policy**
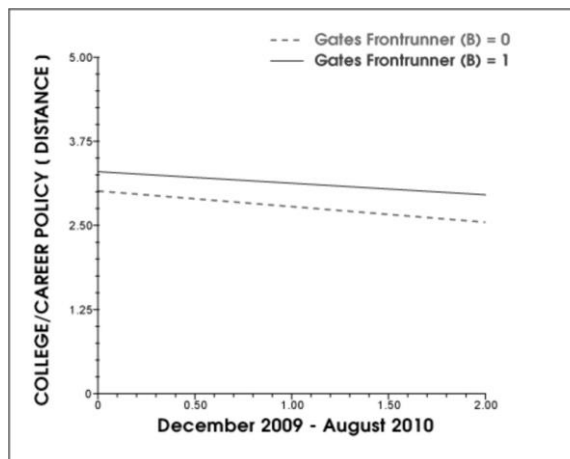
**Figure 36. Gates frontrunner state, Time 2,
College and Career Readiness policy**
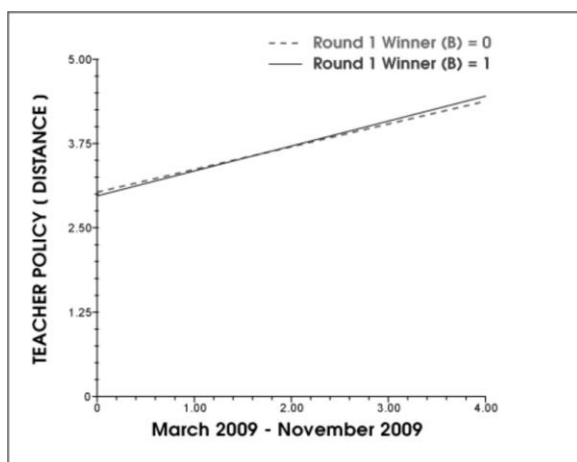
**Figure 37. Round 1 Winner state, Time 1,
Teacher Policy**
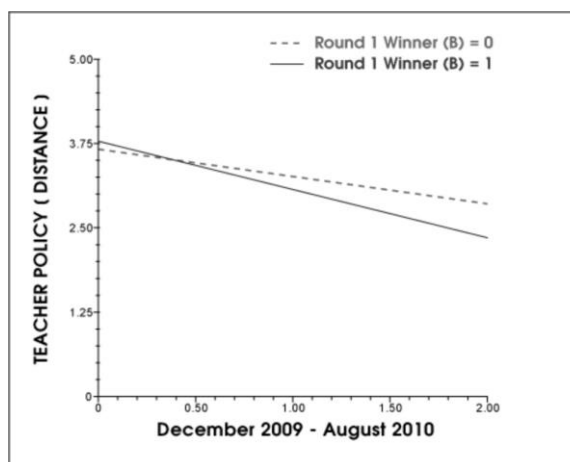
**Figure 38. Round 1 Winner state, Time 2,
Teacher Policy**

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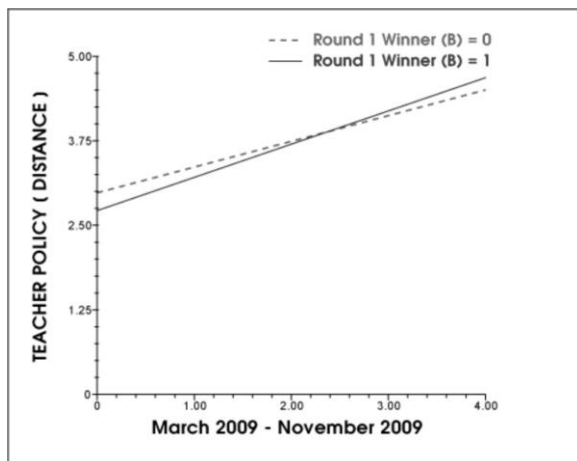
Figure 39. Round 1 Winner state, state fixed effects model, Time 1, Teacher Policy
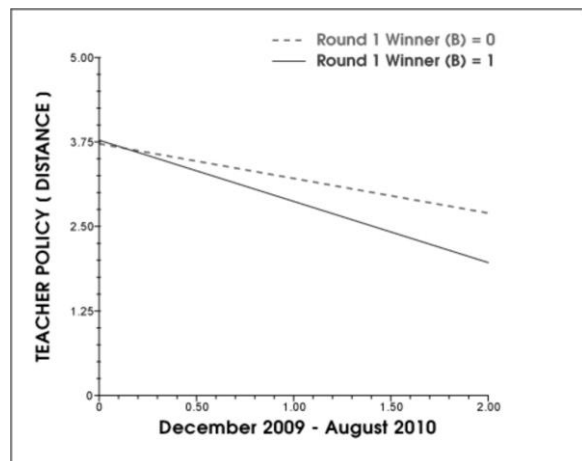
Figure 40. Round 1 Winner state, state fixed effects model, Time 2, Teacher Policy
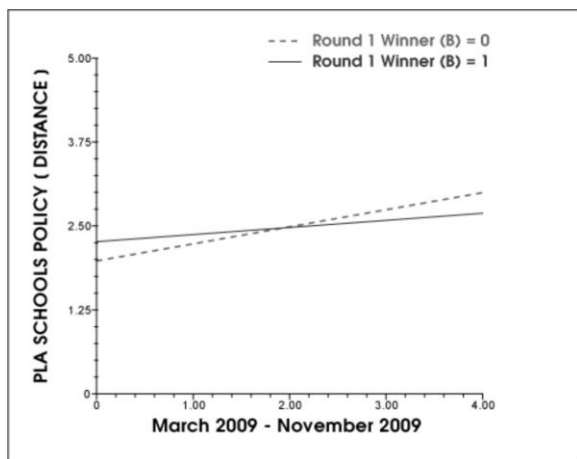
Figure 41. Round 1 Winner state, Time 1, Persistently Lowest Achieving Schools Policy
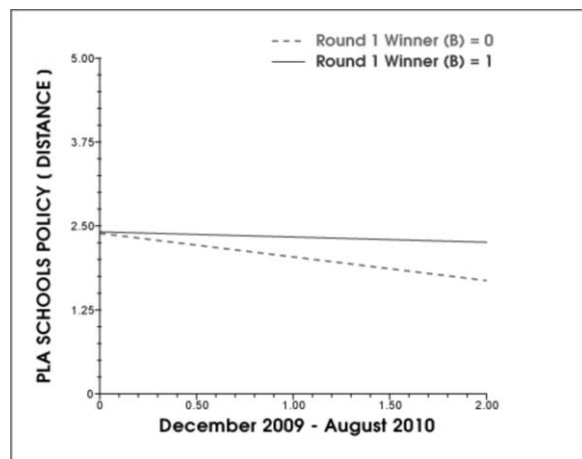
Figure 42. Round 1 Winner state, Time 2, Persistently Lowest Achieving Schools Policy

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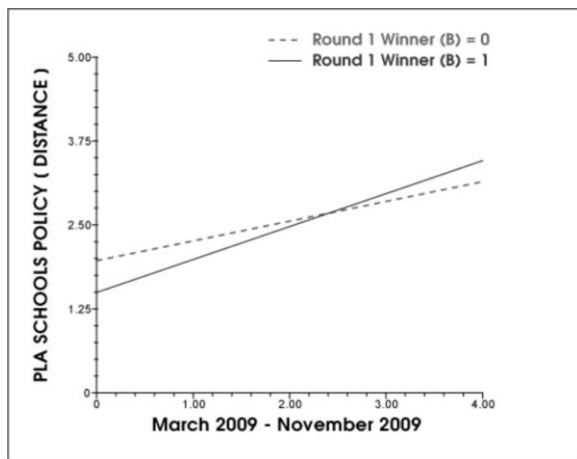
Figure 43. Round 1 inner state, state fixed effects model, Time 1, Persistently Lowest Achieving Schools olicy
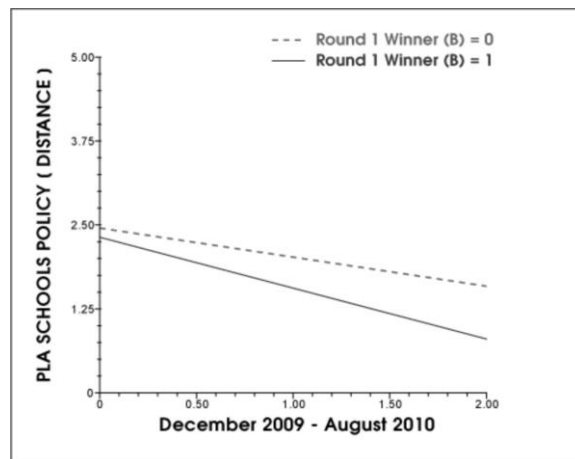
Figure 44. Round 1 inner state, state fixed effects model, Time 2, Persistently Lowest Achieving Schools
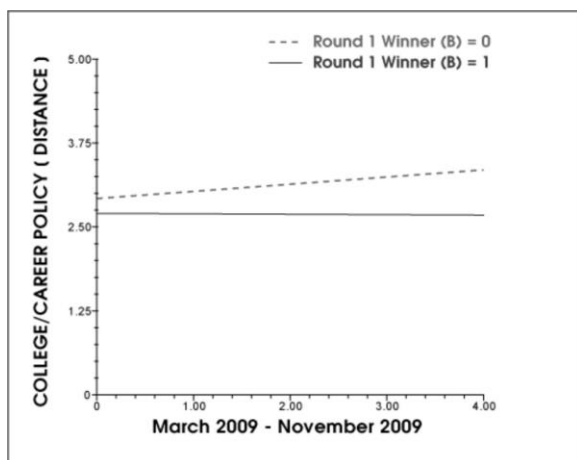
Figure 45. Round 1 inner state, Time 1, College and Career Readiness Policy
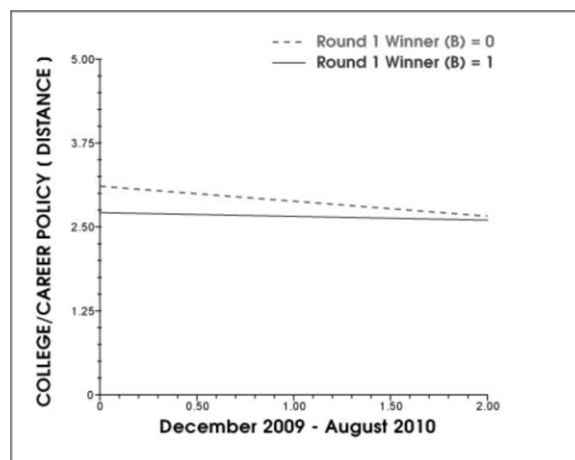
Figure 46. Round 1 inner state, Time 2, College and Career Readiness Policy

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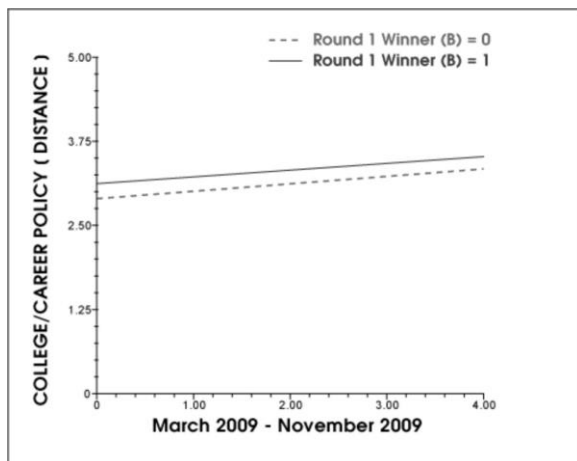
Figure 47. Round 1 inner state, state fixed effects model, Time 1, College and Career Readiness Policy
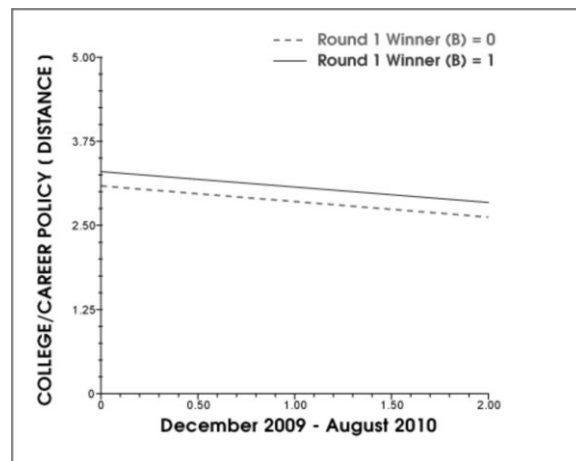
Figure 48. Round 1 inner state, state fixed effects model, Time 2, College and Career Readiness Policy

5.2.4.2 Findings for vertical diffusion: Is there evidence that federal actions impacted policy behavior?

As stated in the previous paragraph, the clearest evidence for federal influence is in the effect for Round 1 winners in teacher policy in Time 2, after the release of final program guidance and the other states had information about federal preferences for Tennessee's and Delaware's policies. In addition to this evidence, the pattern of coefficients in the teacher policy area merits attention. In the first time period, when states had little, inconsistent, or incorrect information about federal policy preferences, state policymaking was inconsistent with the findings for the initial status, expectations, and prior diffusion research. At times, states appeared to be behaving inconsistently, as is suggested by the somewhat mixed findings across the ideology and political party variables. Once federal preferences were clearer and more explicit, states' policymaking reverted to the pattern seen at the initial status (i.e. the relationships between variables and state

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policy distance before RTTT). This pattern is not evident in the results for college and career readiness policy or persistently lowest achieving schools policy.

That state policymaking in the teacher policy area is following patterns distinct from those in the other two policy areas is not surprising if understood in the broader education policy and interest group context. While many groups, including the Gates Foundation with Measures of Effective Teaching and the U.S. Department of Education with Teacher Incentive Fund grants, had been working to change teacher policy prior to RTTT, Race to the Top, particularly in the later half of the 18 month period that is the subject of this study, focused and intensified that attention at the state level. (Both Gates' MET and the Teacher Incentive Fund grants were focused more on district policies). While college and career readiness was an implicit focus of the competition, outside groups, such as Achieve through the American Diploma project, had been working with states on college and career ready policy prior to RTTT. And persistently low achieving schools policy changes were, most likely, driven more by the USDOE's non-competitive School Improvement Grants, which offered states funding more quickly than RTTT, even if the states had won, and by ESEA/NCLB Title 1 mandates.
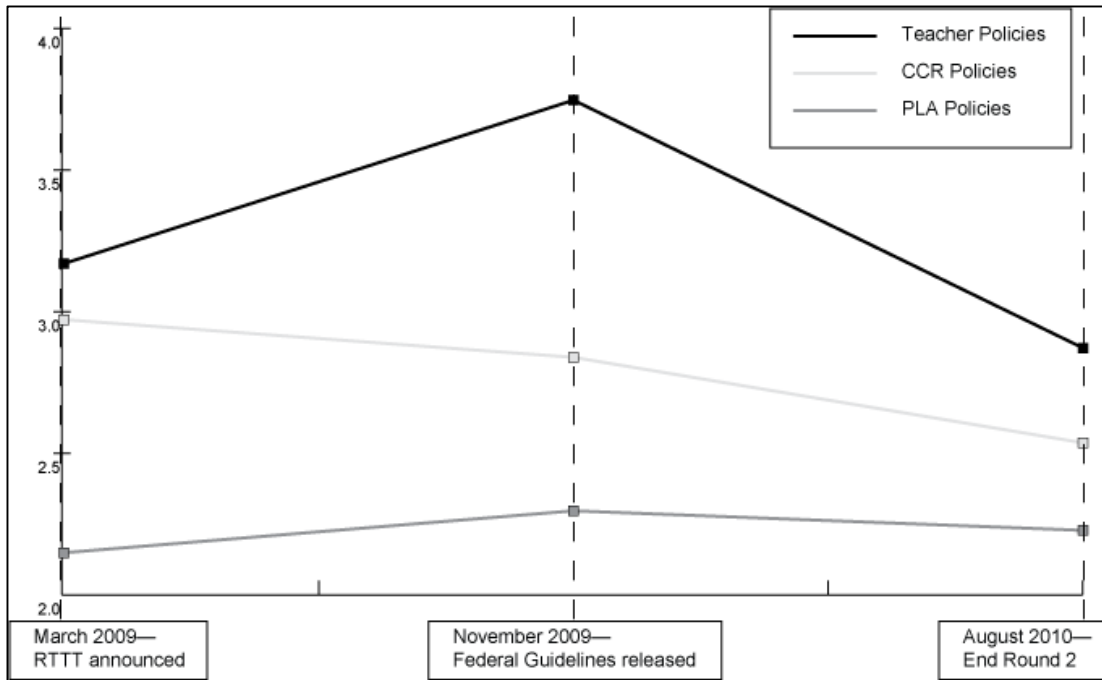
Figure 49. Intercepts, Time 1, Time 2—Three policy areas

Finally, the coefficients of the slopes of the intercepts, indicating the general trends in state policymaking, suggest that in the two areas where the federal government was actively working to impact state policy, teacher policy and persistently lowest achieving schools policy, there is a general divergence in state policies in the first time period and a convergence in state policies in the second time period. This pattern does not hold for the third policy area, college and career readiness, in which there is a general trend toward policy convergence across both time periods. These trends offer further evidence that with relatively small grants and without strong mandates, the federal government moved state policy towards its policy preferences in the policy areas on which RTTT was most focused.

The implications of these findings for state and federal education policy making will be discussed further in the following chapter.

6 CONCLUSION

This final chapter will review the purpose, methods, and findings for this research, highlighting the findings for the effects of state ideology and politics and the results that support the influence of explicit and implicit expressions of federal preferences on state policy change and diffusion processes. This will lead into a discussion of the contributions of the study to the methods for studying diffusion and to our understanding of the effects of competitive federal grants on state policy actions. I will conclude with lines for future research suggested both by the substantive results and by the use of a directed state-dyad dependent variable to measure state policy change with a multilevel growth model in state policy diffusion research.

6.1   REVIEW OF THE STUDY

This analysis sought to understand the impact of the U.S. Department of Education's competitive grant program, Race to the Top, on state-level policy diffusion during the first two rounds of the competition, from March 2009 to August 2010. State education policies, both legislative and regulatory, passed by 46 states during this time span in three policy areas were analyzed and coded at five time points using indicators drawn from *Education Week's* Ed Counts database of state policy characteristics. These codes were used to calculate state policy distance between state pairs. Every state's policies at each time point (t) were compared to every other state's

policies at the prior time point (*t-1*) for every time period. Because each state could appear as either the first state in the dyad or the second state in the dyad, this procedure yielded dependent variables representing directed state-dyads' policy distance. For time points where the first state in the dyad had not made a policy change, the observation was dropped; if there was no change in the state's policy, there was no opportunity for the state to emulate another state.

As I was most interested in the impact of RTTT on states' policy changes in teacher policy, I began the analysis by fitting the best level-1 model for time. The results indicated that both the quadratic model and the piecewise model (dividing the time span into 2 "pieces" at November 2009) fit the data better than linear growth model. However, a chi-squared test of model fit showed that the piecewise linear growth model was the best fit. This finding is within itself important, as it indicates that, in the teacher policy area, the trajectory of state policymaking changed when the states received more information about federal policy preferences. The use of the piecewise growth model had additional benefits, allowing the comparison of the different effects of state characteristics on state policy changes both before and after the release of the final federal program guidance.

The full model included covariates capturing states' economic, demographic, and political characteristics, interest group strength, and frontrunner or Round 1 winner status in line with policy diffusion theory and findings in prior horizontal and vertical diffusion studies. I analyzed data for teacher policy, college and career readiness policy, and persistently lowest achieving schools policy separately for two primary reasons. First, there was evidence that states paid more attention to the teacher policy area during the second half of the competition, after the release of final federal guidance. States passed more teacher policies, and the slopes of the

intercepts suggest that the distance between state policies changed most significantly in teacher policies.

Secondly, prior research suggests that the effect of RTTT on state policymaking in each of the policy areas could be distinct given the differing levels of federal and non-governmental organizations' attention to them (Allen, Pettus, and Haider-Markel, 2004; Karch, 2006; Karch, 2010; McCann, Shipan, and Volden; 2010). While prior attempts to impact teacher evaluation, compensation and tenure policies had largely focused on district policies, states' college and career readiness policy had been the subject of considerable attention from groups outside the federal government (e.g. Achieve; Counsel of Chief State School Officers; National Governor's Association) and persistently lowest achieving schools policies were the focus of a non-competitive grant program operating at the same time as RTTT. Thus, teacher policy had the potential to offer the clearest view of federal influence on state policies.

Results from the full quantitative models found mixed support for the effect of states' economic and demographic characteristics on state policy diffusion. Stronger effects were observed for political and ideological factors. Though state ideology and shared party control across states were largely insignificant across both time periods for college and career readiness policy and persistently lowest achieving schools policy, these variables were significant in teacher policy. This is notable though perhaps not surprising; teacher policy was the most politically contentious of the three policy areas and presented both Democratic and Republican governments with competing political choices.

The distinct effects for these direct measures of political characteristics in teacher policy continued for the impact of teachers unions' political contributions. While teachers' union

strength was related to a divergence from other states' policies in Time 1 in teacher policy, their ability to influence their states' moving towards other states' policies waned in Time 2.

Finally, the effect of an elected chief state school officer was largely similar across policy areas and across time periods. Particularly in Time 2, states with elected CSSOs were less likely to adopt policies from states with appointed CSSOs, which may be reflective of their need to be more responsive to education interest groups than either appointed officials or other statewide elected officials who would be measured by their performance on numerous issues in addition to education.

The effects of the second state in the dyad (i.e. the "policy sending" state) being either a Gates "frontrunner" or a Round 1 winner state were notable in both teacher policy and persistently lowest achieving schools policy. The results for the persistently lowest achieving schools area suggest that while states were willing to move toward the policies in line with SIG program guidance that Round 1 winners Tennessee and Delaware had passed during time 1, other states moved away from Tennessee and Delaware's policies in Time 2 as both Tennessee and Delaware had passed policies that allowed for much more intrusive state interventions in low performing schools, including removing schools from home district oversight.

Perhaps most importantly, however, both the effects of *Round 1 winner (B)* and *Gates "frontrunner" state (B)* were negative and significant in Time 2. This adds to the evidence that, in the policy area on which RTTT had the most potential to influence states, states adopted policies in line with federal preferences or perceived federal competition favorites. Cumulatively, the model fit, the change in the signs of the coefficients between Time 1 and Time 2 in teacher policy, and the media accounts of state political and policy activity also support this finding. Further, the slopes of the intercepts in the policy areas in which the federal government

had given the clearest guidance to the states, teacher policy and persistently lowest achieving schools policy, showed a pattern of movement away from other states' policies in Time 1 and towards other states policies in Time 2, though these effects were significant only in teacher policy.

These findings and the methods employed in this analysis may have implications for federal education policy and, more broadly, for the diffusion literature. These potential impacts will be discussed in the following sections, starting with the implications for diffusion research.

6.2   IMPLICATIONS FOR STUDIES OF HORIZONTAL AND VERTICAL DIFFUSION

As highlighted in Chapter 2, prior diffusion research largely concentrates on state-to-state, horizontal diffusion processes; many of these studies treat federal preferences, or the impact of federal programs, as a nuisance for which the researcher must control rather than as an important influence that may significantly change state policy diffusion processes. The vertical diffusion literature is a fraction of the size of the horizontal diffusion literature, and the number of studies investigating horizontal and vertical factors simultaneously is even more limited. Particularly in areas where the federal government has policy preferences, such as education policy, it is difficult to fully understand state-level diffusion processes without considering the influence of federal actions or implicit or explicit preferences.

6.2.1 Federal attention and rapid diffusion processes

Increasing federal attention to policy areas that have historically been the domains of states suggests that we may see increasingly rapid and complex diffusion of state policy. However, much of the diffusion literature examines the spread of policies across states over many years, if not decades. Attention from the federal government has the potential to put policy areas and ideas on states' agendas, and policy pressures, or, in the case of RTTT, incentives, can lead states to rapidly adopt similar policies. The small segment of state diffusion literature that has examined vertical diffusion processes has noted the rapid diffusion of policies when federal preferences are clear and unambiguous.

Additionally, the means of communication and the rapid dissemination of information across states has allowed policymakers to learn from other states more quickly, which will most likely influence the speed with which policies diffuse. The acceleration of diffusion processes, the influence of isomorphic pressures to conform to the policies of other states, and the influence of federal pressure given states' contexts and characteristics may necessitate considering more complex forms of the dependent variable, beyond dichotomous or event count representations.

6.2.2 Implications for the form of the dependent variable in diffusion studies

These suggest that the dependent variable most often used in prior diffusion studies may not be appropriate for future research in policy areas where federal attention is likely accelerating state policymaking. The directed state-dyad policy distance dependent variable employed in this and other recent studies of policy diffusion (e.g. Volden, 2006; Gilardi, 2010), and used more broadly in the international relations literature, may be more appropriate for examining diffusion

when there is federal pressure particularly when, in the case of Delaware and Tennessee, states with existing policies in line with federal preferences can be identified.

The directedness of the policy distance measure is also useful in understanding whether characteristics of one of the states in the dyad or states' shared characteristics impacted policy diffusion and adoption decisions. For example, in this analysis, the inclusion of a variable capturing the political spending of teachers' unions in the state allowed for the investigation of whether states with greater levels teachers' unions' contributions were more or less likely to be following the general policy adoption patterns of other states. In the case of teacher policy, at least, this highlighted the importance of teachers' unions' contributions in policy adopting states in Time 1, with higher contributions associated with state policies less similar to other states, an effect which reversed in Time 2. Additionally, the ability to understand the distinct effects of differences in state ideology and states' shared political party control had over the course of the competition in the teacher policy area suggests that political calculations were complex and these different influences may not have been so apparent without the ability to capture the direction of states' policy moves.

6.2.3 Potential advantages for the use of growth models to understand policy diffusion

In addition, the piecewise linear growth model used in this model enabled me to model the impact of federal actions. The growth model, in conjunction with the policy distance measure, captured the changes in state policy distance seemingly in response to the release of final federal program guidance. The piecewise growth model also allowed me to compare time periods before and after states had complete information about federal preferences. Particularly in teacher

policy, prior to the states having clear information about federal preferences, states appeared to be making both intuitive and counterintuitive policy choices. In the first time period, states seemed to be looking more to their natural political allies, states controlled by the same political party, for policy ideas, but there was also evidence they adopted policies from states with population sizes distinct from their own. While the effect was somewhat small, it was, nonetheless, significant. In the second time period, however, many of the coefficients significant in Time 1 changed direction and states largely returned to policymaking patterns we would expect given findings from prior diffusion research. The piecewise model allowed for the detection of these phenomena.

6.2.4 Geographic proximity or state characteristics

Finally, and somewhat more generally, this analysis highlights the importance that different correlates of diffusion may have in different policy areas and in different political contexts. While geographic proximity has been significant in many other diffusion studies, in this analysis its inclusion in the models resulted in significantly worse model fit. It is reasonable to assume that, as Walker (1969) suggested, the importance of states' geographic proximity may be decreasing and the effects for geography may be better explained by other state characteristics, e.g. ideology, per capita income, size, or educational attainment. This may be particularly true for policies that are most likely to rapidly diffuse. A reasonable argument can be made that states' shared border may continue to be significant for tax or gambling policies where a states' workforce or revenues may be impacted. For policies where population or company mobility is less relevant, we should not expect significant effects for geographic proximity and should instead focus on variables capturing states' economic, demographic and political characteristics.

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While North Carolina and Tennessee share a border, the findings from this analysis suggest that factors other than their shared border had greater impact on the diffusion of policies between them.

In sum, this study suggests a number of potential directions for future state policy diffusion studies. Of particular importance, with the potential for increasing speed with which policies diffuse, may be the use of the directed state-dyad dependent variable, which has advantages of the state-year dependent variable employed in many previous studies of policy diffusion. In addition, the piecewise linear growth model used in this analysis allowed me to explore the different effects of independent variables on the distance between states' policies both before and after states had full information about federal preferences. Finally, I note the insignificance of geographic proximity across all policy areas in all time periods and suggested that where there is no a priori hypothesis about the effect of states sharing a contiguous border, as would be the case for gambling or tax policy, the effect of proximity may better explained by states' shared characteristics, as other researchers have suggested.

6.3   IMPLICATIONS FOR FEDERAL EDUCATION POLICY

While federal programs have historically relied on mandates and categorical funding streams to influence state policy, this analysis suggests that competitive grant programs like Race to the Top may be useful in moving state policies to be in line with federal preferences. The model building process, the results for the final model (in particular the significant effects and directions of the intercepts of the slopes of Time 1 and Time 2 and the indicator for Round 1 winner), and the media reports from states provide evidence that states responded to implicit and

explicit information about federal preferences. In pursuit of the grant money, states were willing to make significant policy changes to even the most politically contentious of their education policies, specifically to teacher evaluation, compensation, and tenure systems, in order to make their RTTT applications more competitive. Though the amount of the awards to states was relatively small—the largest awards were $700 million over the course of four years to Florida and New York—and there was no guarantee that states would receive funding regardless of the policy changes they made, states made policy changes with tremendous speed.

Competitive grants have advantages over mandates and categorical funding, both for states and for the federal government. Though states are not guaranteed funding, competitive programs designed in the manner of RTTT, with clear goals but no strict requirements for implementation of those goals, could allow states to design their proposals in keeping with their contexts and capacities. Whether or not states did this for their RTTT applications is somewhat debatable, but that core principal of goals without implementation mandates remains. This approach to federal policy may be more suitable then mandates for deterring states from establishing low standards in order to ensure that they do not suffer the consequences of failure, as was the case for many states' responses to NCLB.

It is reasonable to counter this argument by noting that states appear to have passed policies and written their proposals with the intent of appealing to RTTT reviewers, regardless of their capacity to implement the reforms. The findings of this study suggest that, for teacher policy, states reacted to the federal preferences without significant consideration of their implementation capacities. The effects of this apparent lack of consideration of their capacity and the context for implementation can be seen in the progress reports released by the USDOE ("Race to the Top annual performance report," n.d.; McNeil, 2013). However, it may be

important to remember that state implementation of NCLB was also inconsistent, though implementation was much more clearly delineated in NCLB regulations. The difficulties that states have had in implementing their RTTT proposals are, perhaps, a reflection of their inability to articulate internal capacity. As other researchers have noted (Brown, Hess, Lautzenheiser, and Owen, 2011), this may be an unintended consequence of the categorical funding streams, like ESEA/NCLB, through which money flows through state departments of education to local districts. While RTTT may not be the solution to state and district capacity issues, one can make a plausible argument that the competitive grant aspect of the program was not the cause of states' difficulties.

For the federal government, the advantages of competitive grant making over mandates or categorical funding are clearer than for states. Without the guarantee of funding, states made significant policy changes seemingly in response to this federal program and, in teacher policy, at least, largely in line with federal preferences. That the effects of the program were somewhat muted in states with an elected Chief State School Officer may also hint that appealing to the competitive nature of statewide politicians whose election prospects are not solely influenced by state education policy, like governors, may be an advantage of the competitive aspect of RTTT.

Further, states made these changes willingly and across political and ideological lines. Georgia was the most ideologically conservative state in this analysis, and, yet, the state's Republican governor heaped praise on RTTT and worked fervently to pass policies he and legislative sponsors believed would make the state more competitive. Similarly, Governor Pawlenty, in Minnesota, who ran for the Republican nomination for President in 2012 and actively supported President Obama's opponents in 2008 and 2012, put forth significant effort to pass policies that would put the state in a better position to receive funding. And yet, of the states

discussed in Chapter 4, only the Democratic governors managed to pass significant teacher reforms (and neither of these states won RTTT funding). These cases are illustrative of the cross-partisan state policymaking that RTTT inspired.

While categorical grants and mandates have, historically, been the means through which the federal government moves state education policy, the success of RTTT in spurring state policy change suggests competitive grants as a viable mechanism through which the federal government can influence state policy. Whether RTTT or future as-yet-not-conceived grant competitions can impact long-term state capacity for reform remains an unanswered question.

6.4   FUTURE LINES OF RESEARCH

Numerous lines of research could emerge from the present study in policy and implementation research, examples of which are offered below. As discussed above, the dependent variable capturing state policy movement and the direction of state policy change, towards or away from other states and the quantitative model for the analysis, a growth model, have the potential to help policy researchers understand the trajectory of state education policy changes and the impact of federal actions on state-level policy diffusion. For example, as states propose NCLB-waivers and submit revisions to those waivers, is there evidence that states are looking to more "successful" states for change ideas? Additionally, given the results suggesting of the differential effects of federal preferences across policy, is there evidence that states are finding more success in implementing college and career readiness policies, which appear to be the least impacted by federal actions, as opposed to teacher policies, which evidence suggests was an area in which states were most reactive to federal preferences? And, to delve further into the policymaking of

states during Rounds 1 and 2 of RTTT, we know that states, or at least Colorado, were carefully parsing the messages coming from the US Secretary of Education and the USDOE. Is there evidence that Round 1 reviewers, in their comments and scoring of states' Round 1 applications, influenced state policy changes?

As the Obama administration once again pushes for re-authorization of ESEA and as subsequent rounds of RTTT focus on district reforms and states' early education policies, numerous avenues for the further study of the interaction of federal action and state-level policy processes will continue to emerge.

STATE APPLICANTS FOR RACE TO THE TOP FUNDING

Table 9. States applying for RTTT funding in Rounds 1 and 2

State	Round 1 rank	Round 2 rank (points received)	RTTT Award Round (amount)
Alabama	37	36	
Alaska	--	--	
Arizona	40	12	
Arkansas	17	21	
California	27	16	
Colorado	14	17	
Connecticut	25	25	
Delaware	1	--	1 ($100m)
District of Columbia	16	6	2 ($75m)
Florida	4	4	2 ($700m)
Georgia	3	8	2 ($400m)
Hawaii	22	3	2 ($75m)
Idaho	28	--	
Illinois	5	15	
Indiana	23	--	
Iowa	24	22	
Kansas	29	--	
Kentucky	9	19	
Louisiana	11	13	
Maine	--	33	
Maryland	--	6	2 ($250m)
Massachusetts	13	1	2 ($250m)
Michigan	21	23	
Minnesota	20	--	

Mississippi	--	34	
Missouri	33	30	
Montana	--	35	
Nebraska	39	31	
Nevada	--	24	
New Hampshire	38	29	
New Jersey	18	11	
New Mexico	30	28	
New York	15	2	2 ($700m)
North Carolina	12	9	2 ($400m)
Ohio	10	10	2 ($400m)
Oklahoma	34	20	
Oregon	35	--	
Pennsylvania	7	18	
Rhode Island	8	5	2 ($75m)
South Carolina	6	14	
South Dakota	41	--	
Tennessee	2	--	1 ($500m)
Texas	--	--	
Utah	19	25	
Virginia	31	--	
Washington	--	32	
West Virginia	36	--	
Wisconsin	26	27	
Wyoming	32	--	

EDUCATION WEEK QUALITY COUNTS POLICY INDICATORS

In his 2006 research using directed-dyad event history analysis to investigate state Children's Health Insurance Program policies, Volden used the Centers for Medicare and Medicaid Services website to construct a dataset of state polices on 6 CHIP characteristics states were likely to have modified in the years following program initiation. There was no comparable education dataset with indicators of state policy change available for the time periods required for this analysis. However, the *Education Week EdCounts* policy indicators available through the *Editorial Projects in Education* website (http://www.edweek.org/rc/2007/06/07/edcounts.html?intc=thed) provided a baseline measure of state policies and indicators that could be used to construct a dataset similar to Volden's using state legislation and policy documents found on states education departments, legislatures, and secretaries of states websites. Of the 250 indicators available in the *EdCounts* database, 52 were selected based on their relevance to the three policy areas selected for this investigation. These indicators are listed below, grouped by policy area.

College and Career Readiness Policy
How does the state define college readiness (courses, skills, standards, tests, nodef)
How does the state define work readiness? (courses, skills, standards, tests, no definition)
State has defined college readiness
K-12 education system has work/career readiness definition
How does the state calculate graduation rate?
Number of science credits required for graduation?
Number of math credits required for graduation

State requires high school exit exam/End of Course assessment?
High school assessment aligned to post-secondary requirements
High school assessment use for post-secondary placement
Postsecondary reporting to HS
Individual Graduation/ Postsecondary Plan
Subjects tested on state exam

Teacher/School Leader Policy
State has established alternative-route program(s)
State has an alternative certification pathway for high needs/high needs subjects
Does the state require alternative route teachers to pass subject tests?
Does the state require alternative route teachers to pass pedagogical tests?
Alternative certification program requirements (clinical experience, formal coursework, student teaching)?
State require new teacher induction program?
State requires mentoring program?
Years state pays for induction/mentoring
State subsidizes teacher pay for PD
State has PD standards
State requires PD
Evaluation of teacher prep institutions linked to graduates' classroom performance
State publishes evaluation data for prep programs?
Pay for performance at group/school level linked to student achievement
Pay for performance at individual/classroom level linked to student achievement
Teachers rewarded for differentiated/leadership roles
Teacher incentives for low performing schools/hard-to-staff teaching
Administrators incentivized to work at low performing schools
State assigns unique student ID
State assigns unique teacher ID
State allows student ID to be linked to teacher ID (2006)
State requires annual teacher evaluation
Teacher evaluation linked to student achievement
State requires evaluator training (2010)
State reports school-level salary data (either privately collects or publicly reports)

Persistently Lowest Performing Schools Policy
State provides assistance for PLA schools
State rewards high performing schools
State sanctions low performing schools
State Sanctions allow Charter Conversion
State Sanctions allow EMO takeover
State sanctions allow New Curriculum
State sanctions allow Student Transfer
State sanctions allow School Reconstitution
State sanctions allow School Closure
State sanctions allow State Takeover

State sanctions allow Withholding Funds
Federal Turnaround Models (exact language)
PLA Data reporting requirements

(Mentions RTTT/ARRA)

POLICIES AND LEGISLATION INCLUDED IN THE ANALYSIS

Policies and legislation referring to College and Career Readiness, Teacher and School Leaders, Persistently Lowest-Achieving Schools that were proposed and enacted between March 2009 and August 2010.

Table 10. Relevant policies and legislation passed by RTTT states, March 2009-August 2010

State	Month	Year[17]	Policy/Legislation Name/Number
California	3	2009	Title 5 CCR Sec 80413, 80487
Indiana	3	2009	HB1479
Iowa	3	2009	HB687
Kentucky	3	2009	SB1, Section 19
Mississippi	3	2009	SB2315
Mississippi	3	2009	SB2628
New Jersey	3	2009	SB2707
New Mexico	3	2009	SB152
Rhode Island	3	2009	Standards for Ed Leadership
Rhode Island	3	2009	Alternative Routes Policy
South Dakota	3	2009	SB185
Utah	3	2009	SB81
Utah	3	2009	R277-462
Utah	3	2009	HB328
Alabama	4	2009	290-43
Arkansas	4	2009	HB1808
Arkansas	4	2009	HB1764
Delaware	4	2009	HB102
Maryland	4	2009	HB587
Nebraska	4	2009	LB340
Nebraska	4	2009	LB547
New Mexico	4	2009	SB156

[17] For legislation, month/year refer to the date of bill passage by the legislature; bills and policies were included in the analysis only if they were proposed between March 2009 and August 2010.

State	Month	Year[17]	Policy/Legislation Name/Number
New Mexico	4	2009	SB133
Tennessee	4	2009	0520-02-04-.05
Washington	4	2009	HB2261-Sections 501-507
Washington	4	2009	HB2119
Washington	4	2009	HB2261-Sections 201-203, 601
West Virginia	4	2009	Title 126, 114
Alabama	5	2009	HB262
Arkansas	5	2009	ADE 301
Colorado	5	2009	SB163
Colorado	5	2009	SB160
Florida	5	2009	HB991
Georgia	5	2009	V-SB178
Indiana	5	2009	511 IAC 5-2-3
Minnesota	5	2009	HF2
Nevada	5	2009	AB487
Ohio	5	2009	3301-68-01
Ohio	5	2009	OAC 3301-68-01
Oklahoma	5	2009	SB69
Oklahoma	5	2009	SB268
Oklahoma	5	2009	210:35-25-4
Oklahoma	5	2009	OAC 210:35-25-4
Oregon	5	2009	581-022-1130
Tennessee	5	2009	SB2312
Utah	5	2009	R277-484
Louisiana	6	2009	SB259; HB612
Louisiana	6	2009	SB316
Maine	6	2009	SB458
Nevada	6	2009	SB389
Nevada	6	2009	NAC391
Nevada	6	2009	R048-09
Oregon	6	2009	SB443
California	7	2009	AB2
Connecticut	7	2009	SB1014
Illinois	7	2009	SB1828
Illinois	7	2009	SB1276
Illinois	7	2009	SB2119
Louisiana	7	2009	SB285
Missouri	7	2009	SB291
Missouri	7	2009	SB291
North Carolina	7	2009	HB187
Ohio	7	2009	HB1
Oregon	7	2009	OAR 589-007-0700
Tennessee	7	2009	HB1988
Tennessee	7	2009	0520-01-03-.06
Arizona	8	2009	HB2011
Arkansas	8	2009	ADE 291
Illinois	8	2009	HB1079
Illinois	8	2009	HB2675

State	Month	Year[17]	Policy/Legislation Name/Number
Illinois	8	2009	HB2235
New York	8	2009	NYCRR 30-1.1
Delaware	9	2009	14 Del C 1260-1264
Arkansas	10	2009	ADE 278
California	10	2009	SB551
California	10	2009	V-AB429
California	10	2009	SB19
Ohio	10	2009	OAC 3301-24-05
Ohio	10	2009	OAC 3301-24-05
Washington	10	2009	WAC 181-78A-105
Colorado	11	2009	1 CCR 301-81
Illinois	11	2009	23 IAC 65.20
Rhode Island	11	2009	SB1055
Rhode Island	11	2009	SB728
Rhode Island	11	2009	HB5896
Wisconsin	11	2009	SB371
Wisconsin	11	2009	SB372
Alabama	12	2009	300-4-7
Arkansas	12	2009	005.15.09
Delaware	12	2009	14 Del C 103
Delaware	12	2009	14 Del C 106A
California	1	2010	SB1E
California	1	2010	SB4E
Colorado	1	2010	1 CCR 301-81
Colorado	1	2010	SB36
Illinois	1	2010	SB315
Illinois	1	2010	23 IAC 23.130
Iowa	1	2010	SB2033
Kentucky	1	2010	HB176
Kentucky	1	2010	HB176/703 KAR 5:180
Kentucky	1	2010	703 KAR 5:180
Louisiana	1	2010	LAC 28: CXI- 3,7,11,13,18,20,33,35
Massachusetts	1	2010	SB2247
Michigan	1	2010	HB4787
Michigan	1	2010	SB981
Michigan	1	2010	SB926
Michigan	1	2010	HB5596
Nebraska	1	2010	Title 92 NAC Chapter 10
Tennessee	1	2010	HB7010
Colorado	2	2010	1 CCR 301-84
Colorado	2	2010	1 CCR 301
Colorado	2	2010	1 CCR 301
Delaware	2	2010	HB470
Florida	2	2010	6A-1.09981
Florida	2	2010	6A-5.071
Iowa	2	2010	83.4(7)"a"(5)
Maine	2	2010	SB677
Nevada	2	2010	SB2B

State	Month	Year[17]	Policy/Legislation Name/Number
Virginia	2	2010	SB145/HB1172
Alabama	3	2010	300-4-7
Alabama	3	2010	290-3-52
Alabama	3	2010	290-3-53
Nevada	3	2010	R031-10
New Mexico	3	2010	HB44
New Mexico	3	2010	HB53
New Mexico	3	2010	SB85
New Mexico	3	2010	HB70
New Mexico	3	2010	HB71
New Mexico	3	2010	SB111
South Dakota	3	2010	SB63
South Dakota	3	2010	SB24
Washington	3	2010	SB6696
Washington	3	2010	SB6403
West Virginia	3	2010	HB4436
Arizona	4	2010	HB2298
Arkansas	4	2010	ADE 301
Arkansas	4	2010	ADE 247/005.01.10-006
Florida	4	2010	SB4
Kentucky	4	2010	SB180
Louisiana	4	2010	LAC 28:XLV.501, 601
Louisiana	4	2010	LAC28:XLV.501, .601
Maine	4	2010	SB706
Maine	4	2010	SB623
Maine	4	2010	SB704
Maryland	4	2010	HB439
Maryland	4	2010	SB275
Maryland	4	2010	HB1263
Mississippi	4	2010	SB2293
Nebraska	4	2010	LB1014
New York	4	2010	EDU-26-09-000
Rhode Island	4	2010	Board of Regents Rules
Wisconsin	4	2010	SB437
Arizona	5	2010	R7-2,-604.3
Arizona	5	2010	SB1040
Arizona	5	2010	HB2401
Colorado	5	2010	SB191
Connecticut	5	2010	SB438
Florida	5	2010	6A-1.09422
Georgia	5	2010	HB400
Illinois	5	2010	23 IAC 65.110,.120,.130,.140,.150,.160
Louisiana	5	2010	LAC 28:LXXXIII.Chapter 4
Louisiana	5	2010	LAC 28:CXLVII.Chapters 1-9
Michigan	5	2010	SB757
Minnesota	5	2010	HB2899
New York	5	2010	AB111171
New York	5	2010	EDU-18-10-00015

State	Month	Year[17]	Policy/Legislation Name/Number
New York	5	2010	EDU-18-10-00016
North Carolina	5	2010	SB704
Oklahoma	5	2010	SB2033/SB2032
South Carolina	5	2010	HJR4823
Florida	6	2010	EO 10-126
Louisiana	6	2010	HB1368
Louisiana	6	2010	SB753
Louisiana	6	2010	HB486
New Hampshire	6	2010	SB503
Oklahoma	6	2010	SB1617
Oklahoma	6	2010	HB2968
Rhode Island	6	2010	HJR8175
Illinois	7	2010	SB3705
Nevada	7	2010	NAC385
North Carolina	7	2010	SB1246
West Virginia	7	2010	SB2009
Illinois	8	2010	HB4711
Louisiana	9	2010	HB1033

APPENDIX D

STATES ADOPTING RULES OR LEGISLATION

Table 11. States adopting rules and/or legislation in at least one of three policy areas, by time period

March 2009-July 2009	August 2009-November 2009	December 2009-March 2010	April 2010-August 2010
Alabama	Alabama	Alabama	Alabama
Arkansas	Arizona	Arkansas	Arizona
California	California	California	California
Colorado	Connecticut	Colorado	Colorado
Connecticut	Delaware	Delaware	Connecticut
Delaware	Georgia	Florida	Delaware
Florida	Iowa	Iowa	Florida
Georgia	Illinois	Idaho	Georgia
Iowa	Kansas	Illinois	Iowa
Idaho	Kentucky	Indiana	Idaho
Illinois	Louisiana	Kentucky	Illinois
Indiana	Missouri	Massachusetts	Indiana
Kansas	Montana	Maryland	Kansas
Kentucky	North Carolina	Maine	Kentucky
Louisiana	Nebraska	Michigan	Louisiana
Maryland	New Hampshire	Minnesota	Maryland
Maine	Nevada	Mississippi	Maine
Michigan	New York	Nebraska	Michigan
Minnesota	Ohio	New Hampshire	Minnesota
Missouri	Oregon	New Jersey	Missouri
Mississippi	Rhode Island	New Mexico	Mississippi
Montana	Tennessee	Nevada	North Carolina
North Carolina	Utah	New York	Nebraska
Nebraska	Washington	Ohio	New Hampshire
New Hampshire	Wisconsin	Oklahoma	New Jersey
New Jersey	West Virginia	Oregon	New Mexico
New Mexico	Wyoming	Rhode Island	Nevada
Nevada		South Dakota	New York
New York		Tennessee	Ohio
Ohio		Utah	Oklahoma

Oklahoma		Virginia	Oregon
Oregon		Washington	Rhode Island
Rhode Island		West Virginia	South Carolina
South Carolina		Wyoming	Tennessee
South Dakota			Virginia
Tennessee			Washington
Utah			Wisconsin
Virginia			West Virginia
Washington			
Wisconsin			
West Virginia			
Wyoming			

STATE SELECTION OF CHIEF STATE SCHOOL OFFICER

Table 12. States' selection processes for Chief State School Officer

Statewide Election	Appointed by Governor	Appointed by State Board of Education
Arizona	Delaware	Alabama
California	Iowa	Alaska
Georgia	Minnesota	Colorado
Idaho	New Jersey	Connecticut
Indiana	New Mexico	Florida
Montana	Pennsylvania	Hawaii
North Carolina	South Dakota	Illinois
North Dakota	Tennessee	Kansas
Oklahoma	Texas	Kentucky
Oregon	Virginia	Louisiana
South Carolina		Maryland
Washington		Massachusetts
Wisconsin		Michigan
Wyoming		Mississippi
		Missouri
		Nebraska
		Nevada
		New Hampshire
		New York
		Ohio
		Rhode Island
		Utah
		Vermont
		West Virginia

APPENDIX F

LEADER STATES

States selected to received Gates Foundation funds and technical assistance to prepare RTTT

applications (McNeil, 2009, Gates Foundation, 2009):

Arkansas
Arizona
Florida
Georgia
Kentucky
Louisiana
Massachusetts
Minnesota
New Mexico
New York
North Carolina
Ohio
Pennsylvania
Tennessee
Texas

APPENDIX G

FIGURES FOR CHECKS OF MODEL ASSUMPTIONS
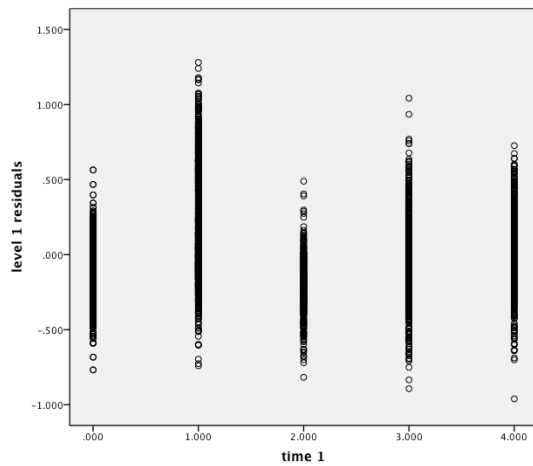
G.1 TEACHER POLICY MODEL:

Level 1:

Figure 50. Teacher policy, plot of level 1 residuals / Time 1
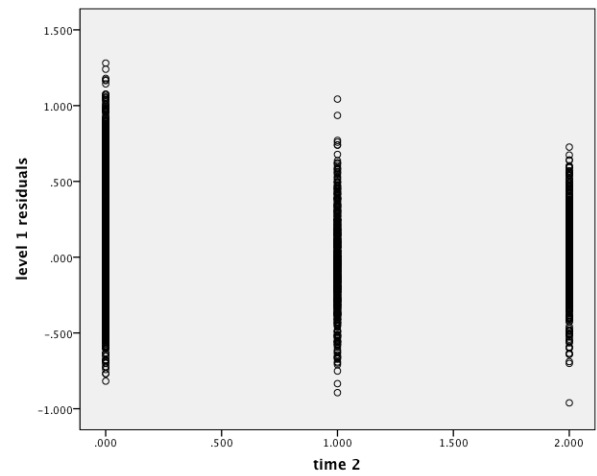

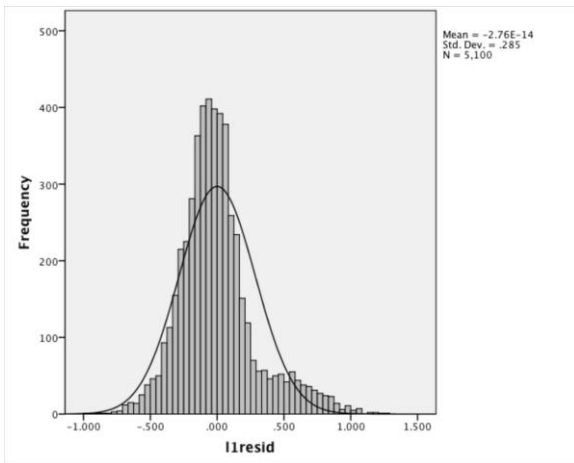**Figure 51. Teacher policy, plot of level 1 residuals / Time 2**

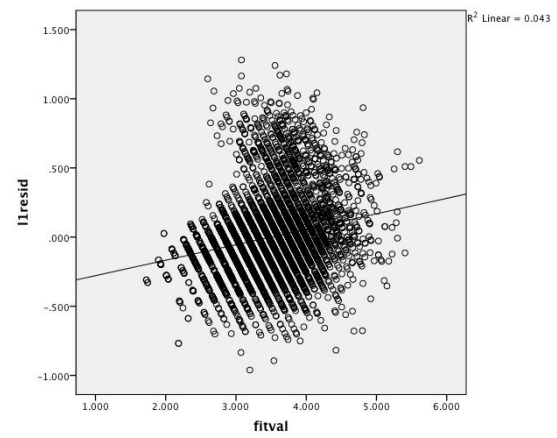**Figure 52. Teacher policy, graph of level 1 residuals**

Figure 53. Teacher policy, plot of level 1 residuals and fitted values of level 1 units
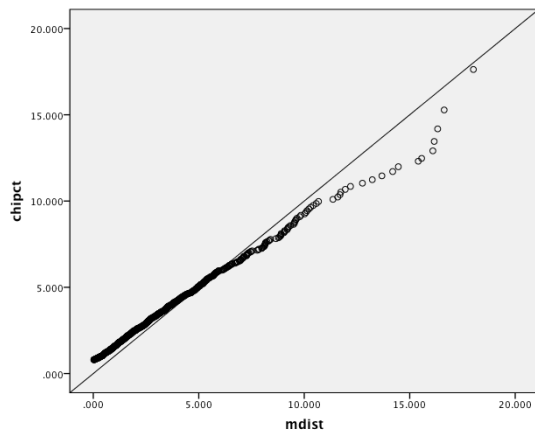
Level 2:

Figure 54. Teacher policy, Q-Q plot of chipct and mdist
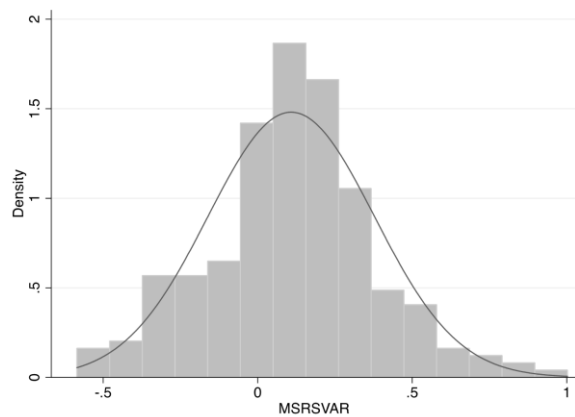
Figure 55. Teacher policy, Histogram of MRSVAR

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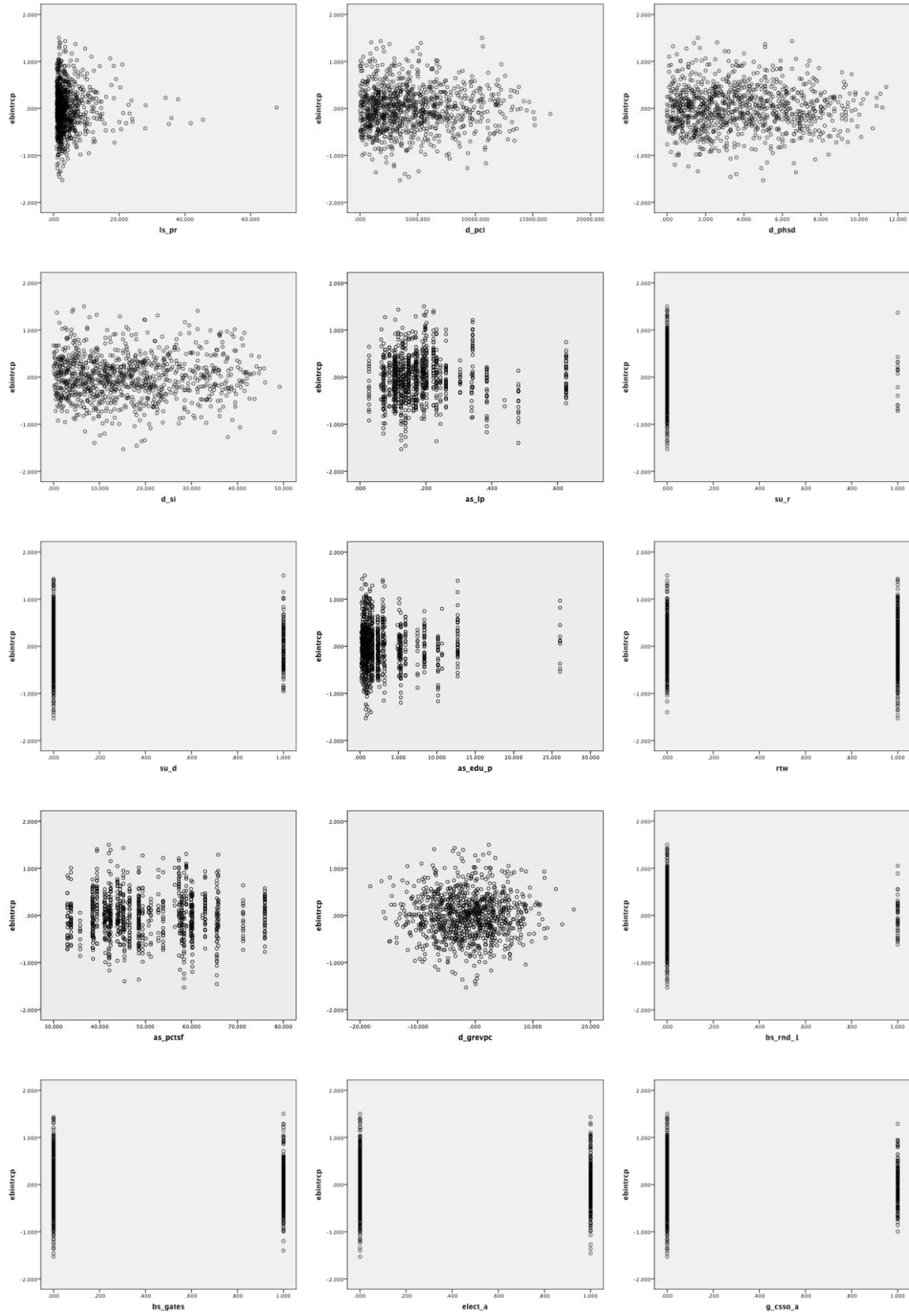
Figure 56. Teacher policy, scatterplots of residuals and level 2 predictors

G.2   PERSISTENTLY LOWEST ACHIEVING SCHOOLS POLICY

Level 1:
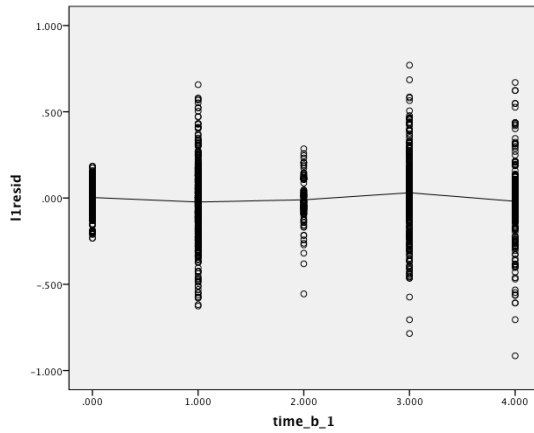
Figure 57. Persistently lowest achieving schools policy plot of level 1 residuals / Time 1
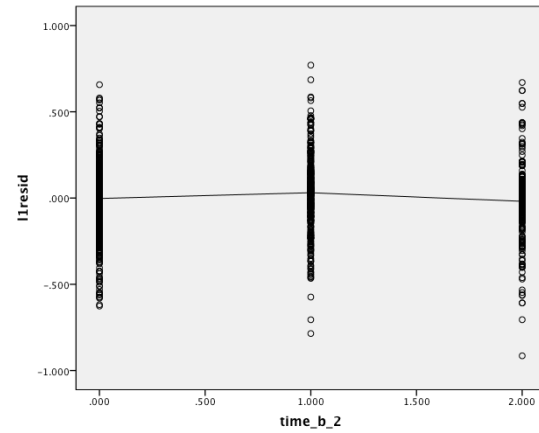
Figure 58. Persistently lowest achieving schools policy plot of level 1 residuals / Time 2
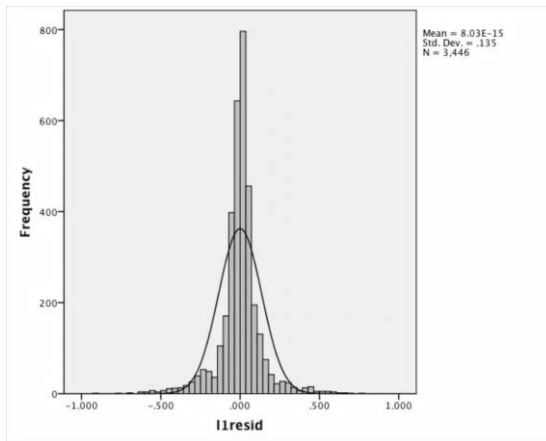
Figure 59. Persistently lowest achieving schools policy, graph of level 1 residuals
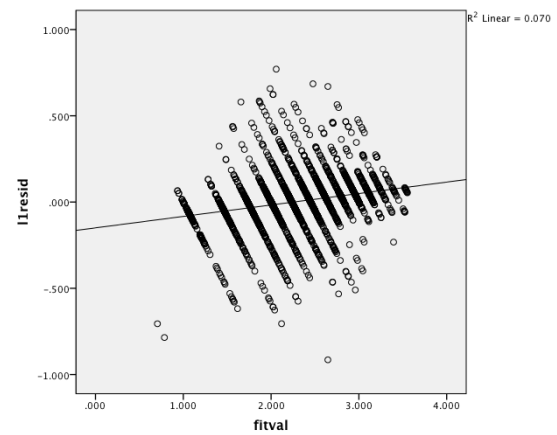
Figure 60. Persistently lowest achieving schools policy, plot of level 1 residuals and fitted values of level 1 units

Persistently Lowest Achieving Schools Policy

Level 2:
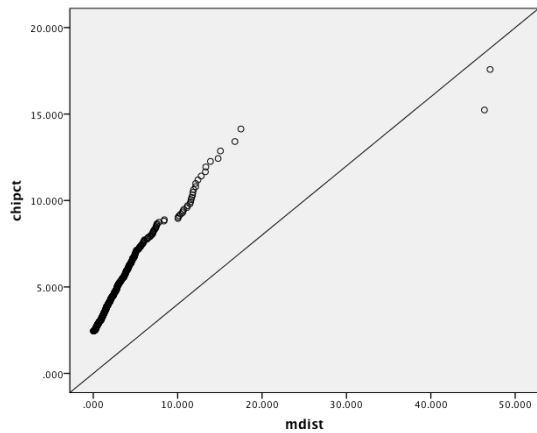
Figure 61. Persistently lowest achieving schools policy, Q-Q plot of chipct and mdist
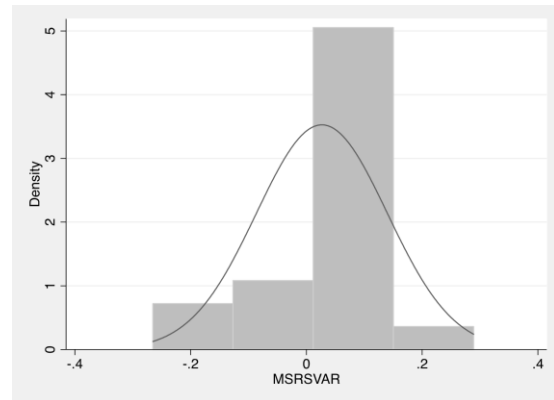
Figure 62. Persistently lowest achieving schools policy, histogram of MRSVAR
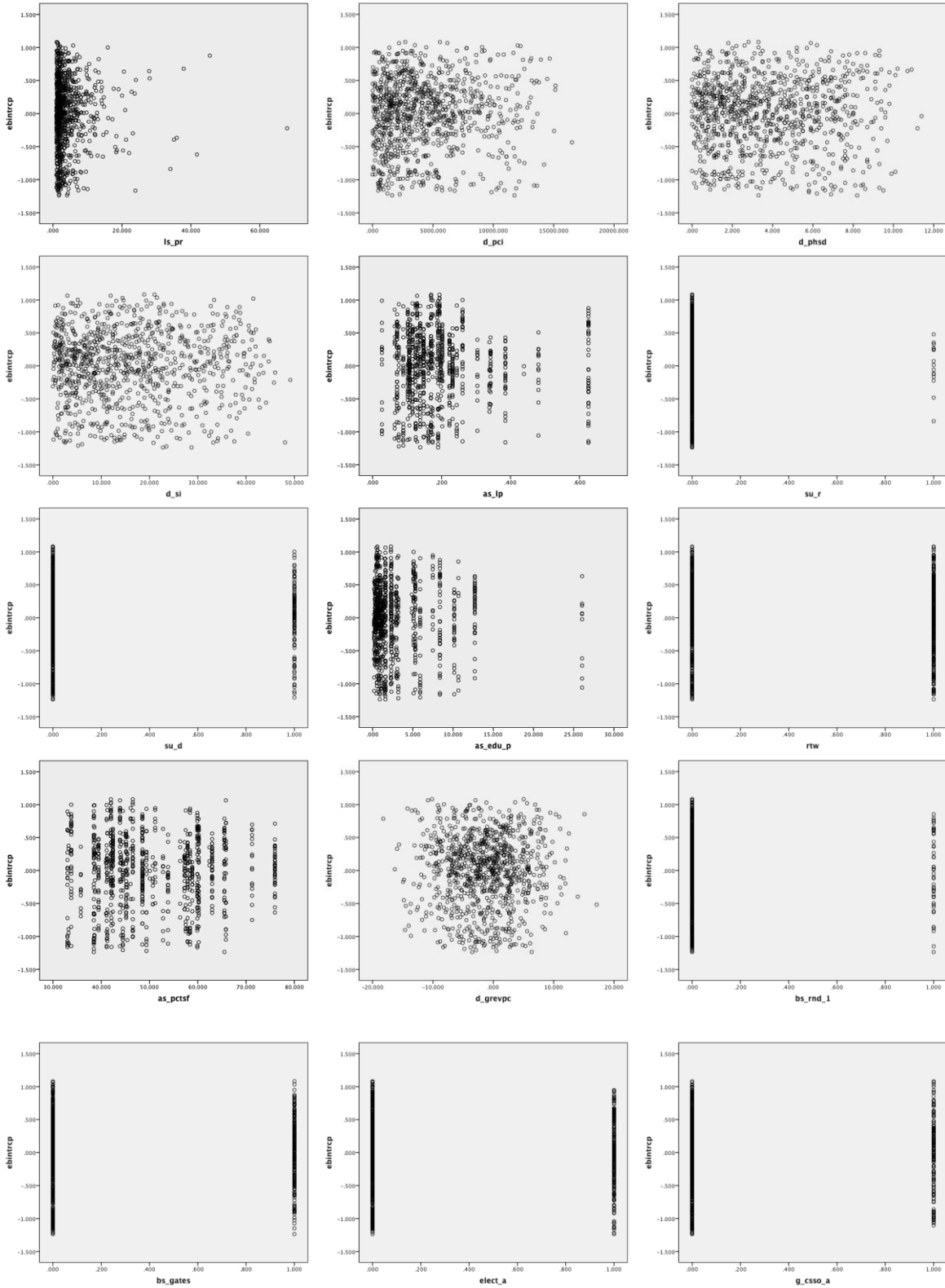
Figure 63. Persistently lowest achieving schools policy, scatterplots of residuals and level 2 predictors

G.3   COLLEGE AND CAREER READINESS POLICY

Level 1:
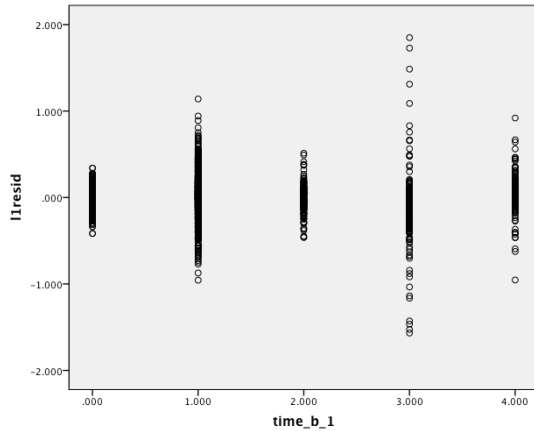
Figure 64. College and career readiness policy, plot of level 1 residuals / Time 1
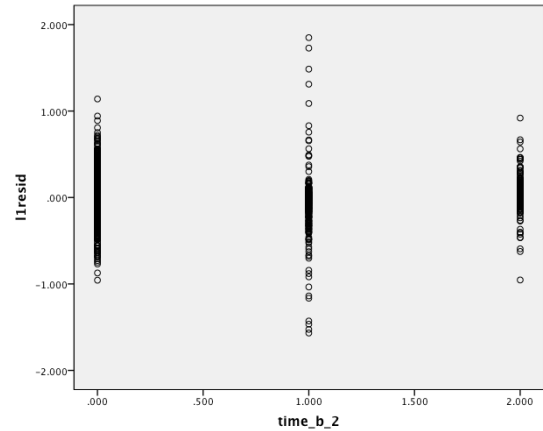
Figure 65. College and career readiness policy, plot of level 1 residuals / Time 2
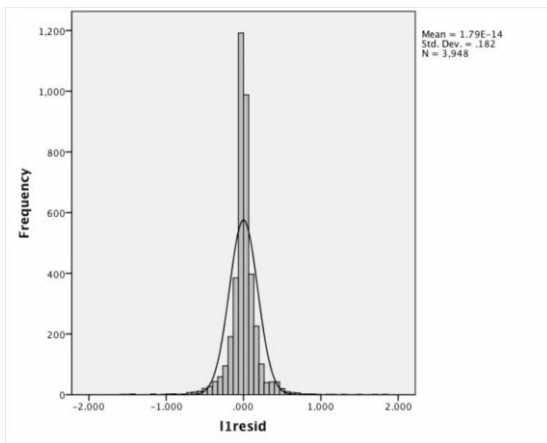
Figure 66. College and career readiness policy, graph of level 1 residuals
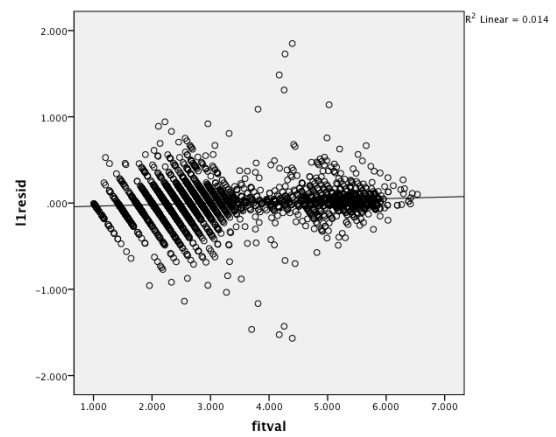
Figure 67. College and career readiness policy, plot of level 1 residuals and fitted values of level 1 units

College and Career Readiness Policy

Level 2:
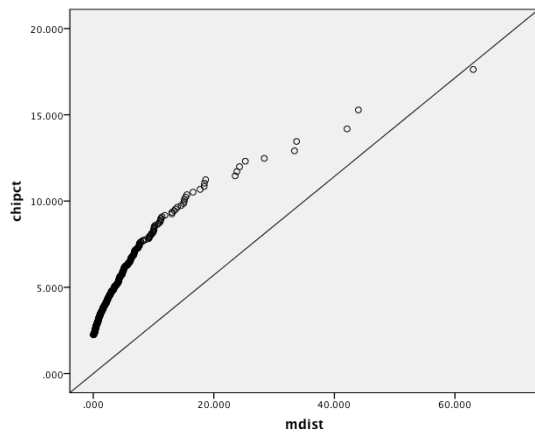
Figure 68. College and career readiness policy, Q-Q plot of chipct and mdist
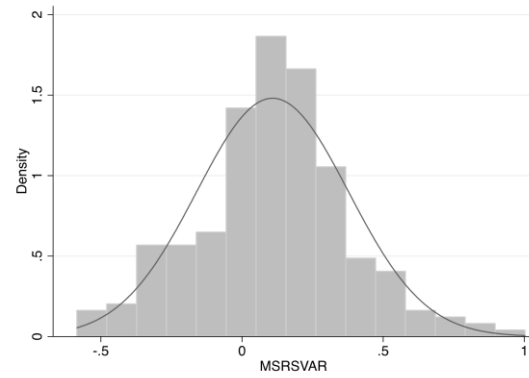
Figure 69. College and career readiness policy, histogram of MRSVAR
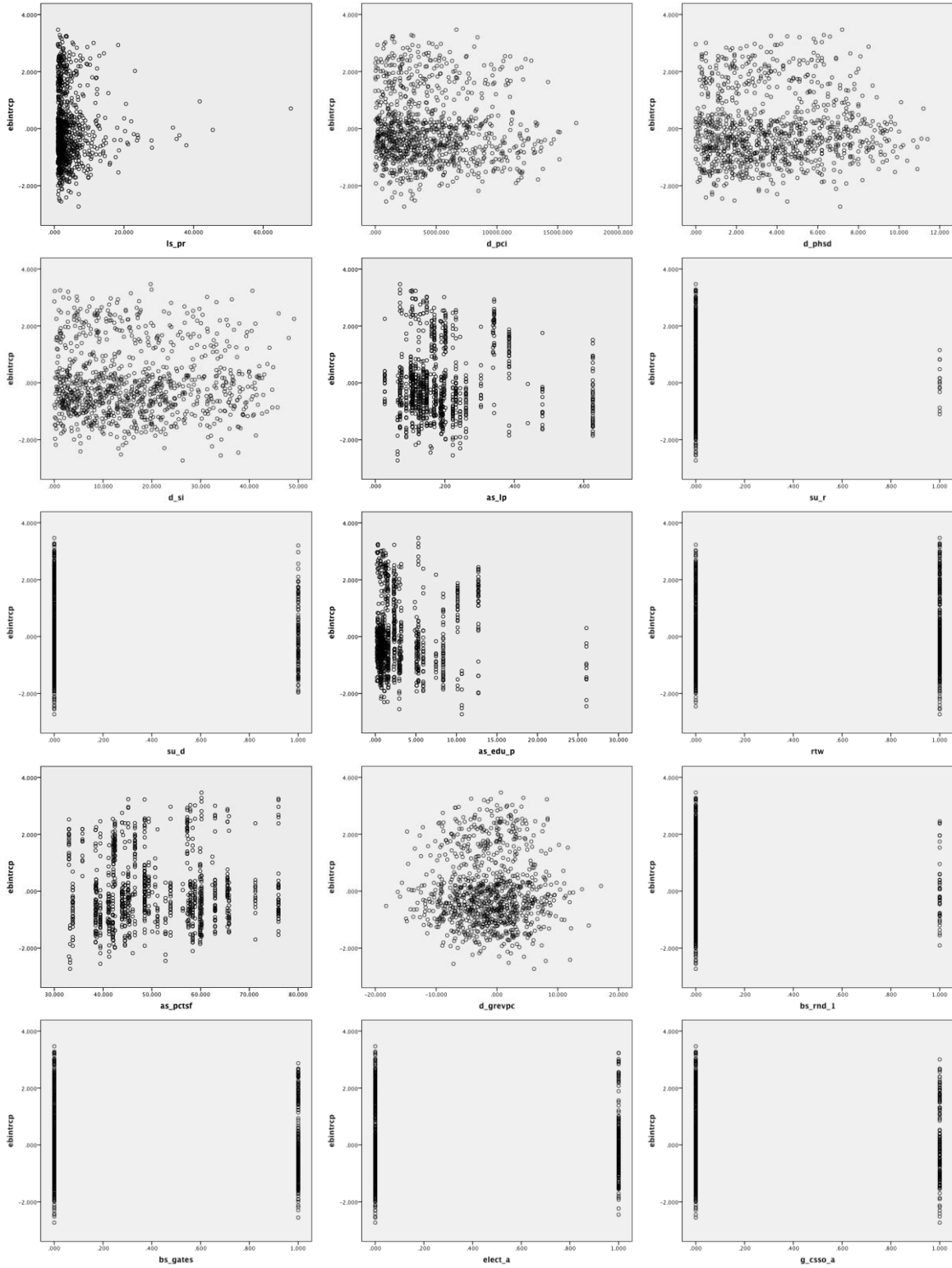
Figure 70. College and career readiness policy, scatterplots of residuals and level 2 predictors

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APPENDIX H

FULL FINAL PIECEWISE LINEAR GROWTH MODEL AND RESULTS

State Dyad Policy Distance = π_{00}
$+ \pi_{10}$(Time [March 2009 – November 2009])$_i$
$+ \pi_{20}$ (Time 2 [December 2009 – August 2010])$_i$
$+ e_{0i}$

$\pi_{00} = \beta_{00}$ (Intercept) Initial status
$+ \beta_{001}$ (State Population Ratio)$_i$
$+ \beta_{002}$ (Difference in Per Capita Income)$_i$
$+ \beta_{003}$ (Difference in High School Diploma Rate)$_i$
$+ \beta_{004}$ Difference in State Ideology)$_i$
$+ \beta_{005}$ (Legislative Professionalism [A])$_i$
$+ \beta_{006}$ (Unified Republican Government [A & B])$_i$
$+ \beta_{007}$ (Unified Democratic Government [A & B])$_i$
$+ \beta_{008}$ (Teachers' Union Political Contributions, Per Student)$_i$
$+ \beta_{009}$ (Right to Work State [B])$_i$
$+ \beta_{010}$ (% of Local School Funds from State Sources)$_i$
$+ \beta_{011}$ (% Change in General Revenue from Prior Year)$_i$
$+ \beta_{012}$ (Round 1 Winner [B])$_i$
$+ \beta_{013}$ (Gates "Frontrunner" State [B])$_i$
$+ r_{0i}$

$\pi_{10} = \beta_{100}$ (Intercept) Growth Time 1
$+ \beta_{101}$ (State Population Ratio)$_i$
$+ \beta_{103}$ (Difference in High School Diploma Rate)$_i$
$+ \beta_{104}$ (Difference in State Ideology)$_i$
$+ \beta_{105}$ (Legislative Professionalism [A])$_i$
$+ \beta_{106}$ (Unified Republican Government [A & B])$_i$
$+ \beta_{107}$ (Unified Democratic Government [A & B])$_i$
$+ \beta_{108}$ (Teachers' Union Political Contributions, Per Student)$_i$
$+ \beta_{109}$ (Right to Work State [B])$_i$

$+ \beta_{110}$ (% of Local School Funds from State Sources)$_i$
$+ \beta_{111}$ (% Change in General Revenue from Prior Year)$_i$
$+ \beta_{112}$ (Round 1 Winner [B])$_i$
$+ \beta_{113}$ (Gates "Frontrunner" State [B])$_i$
$+ r_{1i}$

$\pi_{20} = \beta_{200}$ (Intercept) Growth Time 2
$+ \beta_{201}$ (State Population Ratio)$_i$
$+ \beta_{203}$ (Difference in High School Diploma Rate)$_i$
$+ \beta_{204}$ (Difference in State Ideology)$_i$
$+ \beta_{205}$ (Legislative Professionalism [A])$_i$
$+ \beta_{206}$ (Unified Republican Government [A & B])$_i$
$+ \beta_{207}$ (Unified Democratic Government [A & B])$_i$
$+ \beta_{208}$ (Teachers' Union Political Contributions, Per Student)$_i$
$+ \beta_{209}$ (Right to Work State [B])$_i$
$+ \beta_{210}$ (% of Local School Funds from State Sources)$_i$
$+ \beta_{211}$ (% Change in General Revenue from Prior Year)$_i$
$+ \beta_{212}$ (Round 1 Winner [B])$_i$
$+ \beta_{213}$ (Gates "Frontrunner" State [B])$_i$
$+ r_{2i}$

H.1 FULL MODEL RESULTS

Intercept, π_{00}	Teacher Policy Final Model	College/Career Policy Final Model	Persistently Lowest Achieving Schools Final Model
Intercept, β_{00}	3.17 (0.103)***	2.972 (0.239)***	2.149 (0.111)***
State Population Ratio, β_{01}	-0.002 (0.003)	-0.024 (0.007)**	-0.004 (0.004)
Difference in Per Capita Income, β_{02}	-0.00002 (0.000005)***	-0.00002 (0.00001)	0.00001 (0.000005)
Difference in HS Diploma Rate, β_{03}	-0.007 (0.006)	-0.027 (0.014) [†]	0.024 (0.007)**
Difference in State Ideology, β_{04}	0.005 (0.002)***	0.007 (0.004) [†]	0.0001 (0.002)
Legislative Professionalism (A), β_{05}	0.787 (0.174)***	2.166 (0.400)***	0.004 (0.178)
Unified Republican Government (A & B), β_{06}	0.498 (0.161)**	-0.381 (0.196) [†]	-0.112 (0.099)
Unified Democratic Government (A & B), β_{07}	0.101 (0.060) [†]	0.243 (0.135) [†]	0.118 (0.058)*
Teachers Union Contributions, per student (A), β_{08}	-0.010 (0.005)*	0.054 (0.012)***	-0.003 (0.005)
Right to Work State (B), β_{09}	0.062 (0.046)	0.338 (0.105)**	-0.005 (0.052)
% of Local School Funds from State (A), β_{010}	-0.002 (0.002)	-0.012 (0.004)***	-0.003 (0.002) [†]
Change in General Revenue from Prior Year (A), β_{011}	-0.021 (0.005)***	-0.003 (0.013)	-0.010 (0.006) [†]
Round 1 Winner (B), β_{012}	0.073 (0.071)	-0.272 (0.186)	0.186 (0.096)*
Gates "Frontrunner" State, β_{013}	-0.021 (0.042)	0.353 (0.099)***	-0.075 (0.039) [†]
CSSO Elected, β_{014}	0.020 (0.047)	-0.569 (0.098)***	0.170 (0.047)***
Model for Growth Rate, Time 1, π_{10}			
Intercept, β_{10}	0.557 (0.064)***	-0.133 (0.069) [†]	0.148 (0.089) [†]
State Population Ratio, β_{11}	-0.004 (0.002)*	0.008 (0.002)***	-0.007 (0.003)*
Difference in Per Capita Income, β_{12}	-	–	–
Difference in HS Diploma Rate, β_{13}	0.009 (0.004)*	0.006 (0.004)	-0.005 (0.005)
Difference in State Ideology, β_{14}	-0.003 (0.0009)**	-0.0006 (0.001)	0.001 (0.001)
Legislative Professionalism (A), β_{15}	-0.299 (0.106)**	-0.073 (0.096)	0.307 (0.168) [†]
Unified Republican Government (A & B), β_{16}	-0.166 (0.046)***	-0.141 (0.057)*	0.030 (0.087)
Unified Democratic Government (A & B), β_{17}	-0.139 (0.027)***	0.130 (0.037)***	-0.002 (0.036)
Teachers Union Contributions, per student (A), β_{18}	0.008 (0.003)**	0.006 (0.002)**	-0.002 (0.004)
Right to Work State (B), β_{19}	-0.102 (0.025)***	0.031 (0.028)	0.087 (0.038)***
% of Local School Funds from State (A), β_{110}	-0.002 (0.0009) [†]	0.003 (0.001)**	0.0008 (0.001)
Change in General Revenue from Prior Year (A), β_{111}	-0.007 (0.003)*	-0.007 (0.003)*	0.003 (0.005)
Round 1 Winner (B), β_{112}	0.032 (0.040)	-0.113 (0.082)	-0.148 (0.039)***
Gates "Frontrunner" State, β_{113}	0.022 (0.022)	-0.062 (0.027)*	-0.013 (0.029)
CSSO Elected (A), β_{114}	-0.086 (0.024)***	-0.003 (0.028)	-0.213 (0.042)***
Model for Growth Rate, Time 2, π_{20}			
Intercept, β_{20}	-0.875 (0.120)***	-0.302 (0.154)*	-0.069 (0.215)
State Population Ratio, β_{21}	0.017 (0.004)***	-0.022 (0.006)***	-0.009 (0.007)
Difference in Per Capita Income, β_{22}	–	–	–
Difference in HS Diploma Rate, β_{23}	-0.016 (0.008)*	-0.008 (0.010)	0.0122 (0.012)
Difference in State Ideology, β_{24}	0.004 (0.002)*	0.003 (0.002)	-0.003 (0.003)
Legislative Professionalism (A), β_{25}	0.522 (0.224)*	0.078 (0.276)	-1.113 (0.283)**
Unified Republican Government (A & B), β_{26}	0.060 (0.118)	0.172 (0.262)	-0.051 (0.153)

Unified Democratic Government (A & B), β_{27}	0.232 (0.053)***	-0.134 (0.070) †	-0.093 (0.085)
Teachers Union Contributions, per student (A), β_{28}	-0.013 (0.005)*	0.010 (0.008)	-0.003 (0.009)
Right to Work State (B), β_{29}	0.225 (0.050)***	-0.299 (0.114)**	-0.225 (0.081)**
% of Local School Funds from State (A), β_{210}	0.004 (0.002)*	0.004 (0.003)	0.0001 (0.003)
Change in General Revenue from Prior Year (A), β_{211}	0.033 (0.005)***	-0.016 (0.010) †	-0.009 (0.010)
Round 1 Winner (B), β_{212}	-0.311 (0.089)***	0.167 (0.195)	0.274 (0.099)**
Gates "Frontrunner" State, β_{213}	-0.106 (0.044)*	0.060 (0.062)	0.005 (0.061)
CSSO Elected, β_{114}	0.153 (0.049)**	0.096 (0.076)	0.406 (0.087)***
Random Effects			
Initial status, r_{0i}	0.249 (0.499)***	1.535 (1.234)***	0.299 (0.547)***
Growth rate, Time 1, r_{1i}	0.026 (0.161)***	0.046 (0.213)***	0.064 (0.254)***
Growth rate, Time 2, r_{2i}	0.065 (0.255)***	0.201 (0.448)***	0.251 (0.501)***
Level-1 error, e_{0i}	0.114 (0.337)	0.061 (0.247)	0.038 (0.195)
Deviance (estimated parameters)	6709.34 (7)	6554.08 (7)	3506.045 (7)

	TL Initial	TL Time 1	TL Time 2	CCR Initial	CCR Time 1	CCR Time 2	PLA Initial	PLA Time 1	PLA Time 2
Intercept, $\beta 00$	3.17 (0.103)***	0.557 (0.064)***	-0.875 (0.120)***	2.972 (0.239)***	-0.133 (0.069)†	-0.302 (0.154)*	2.149 (0.111)***	0.148 (0.089)†	-0.069 (0.215)
State Population Ratio, $\beta 01$	-0.002 (0.003)	-0.004 (0.002)*	0.017 (0.004)***	-0.024 (0.007)**	0.008 (0.002)***	-0.022 (0.006)***	-0.004 (0.004)	-0.007 (0.003)*	-0.009 (0.007)
Difference in Per Capita Income, $\beta 02$	-0.00002 (0.0000005)***	–	–	-0.00002 (0.00001)	–	–	0.00001 (0.0000005)	–	–
Difference in HS Diploma Rate, $\beta 03$	-0.007 (0.006)	0.009 (0.004)*	-0.016 (0.008)*	-0.027 (0.014)†	0.006 (0.004)	-0.008 (0.010)	0.024 (0.007)**	-0.005 (0.005)	0.0122 (0.012)
Difference in State Ideology, $\beta 04$	0.005 (0.002)***	-0.003 (0.0009)**	0.004 (0.002)*	0.007 (0.004)†	-0.0006 (0.001)	0.003 (0.002)	0.0001 (0.002)	0.001 (0.001)	-0.003 (0.003)
Legislative Professionalism (A), $\beta 05$	0.787 (0.174)***	-0.299 (0.106)**	0.522 (0.224)*	2.166 (0.400)***	-0.073 (0.066)	0.078 (0.276)	0.004 (0.178)	0.307 (0.168)†	-1.113 (0.283)**
Unified Republican Government (A & B), $\beta 06$	0.498 (0.161)**	-0.166 (0.046)***	0.166 (0.118)	-0.381 (0.196)†	-0.141 (0.057)*	0.172 (0.262)	-0.012 (0.099)	0.030 (0.087)	-0.051 (0.153)
Unified Democratic Government (A & B), $\beta 07$	0.101 (0.060)†	-0.139 (0.027)***	0.232 (0.053)***	0.243 (0.135)†	0.130 (0.037)***	-0.134 (0.070)†	0.118 (0.058)*	-0.002 (0.036)	-0.093 (0.085)
Teachers Union Contributions, per student (A), $\beta 08$	-0.010 (0.005)*	0.008 (0.003)**	-0.013 (0.005)*	0.054 (0.012)***	0.006 (0.002)**	0.010 (0.008)	-0.003 (0.005)	-0.002 (0.004)	-0.003 (0.069)
Right to Work State (B), $\beta 09$	0.062 (0.046)	-0.102 (0.025)***	0.225 (0.050)***	0.338 (0.105)**	0.031 (0.028)	-0.299 (0.114)**	-0.005 (0.052)	0.087 (0.038)***	-0.225 (0.081)**
% of Local School Funds from State (A), $\beta 010$	-0.002 (0.002)	-0.002 (0.0006)†	0.004 (0.002)*	-0.012 (0.004)***	0.003 (0.001)**	0.004 (0.003)	-0.003 (0.002)†	0.0008 (0.001)	0.0001 (0.003)
Change in General Revenue from Prior Year (A), $\beta 011$	-0.021 (0.005)***	-0.007 (0.003)*	0.033 (0.005)***	-0.003 (0.013)	-0.007 (0.003)*	-0.016 (0.010)†	-0.010 (0.006)†	0.003 (0.005)	-0.009 (0.010)
Round 1 Winner (B), $\beta 012$	0.073 (0.071)	0.032 (0.040)	-0.311 (0.089)***	-0.272 (0.186)	-0.113 (0.082)	0.167 (0.195)	0.186 (0.096)*	-0.148 (0.039)***	0.274 (0.099)**
Gates "Frontrunner" State, $\beta 013$	-0.021 (0.042)	0.022 (0.022)	-0.106 (0.044)*	0.353 (0.099)***	-0.062 (0.027)*	0.060 (0.062)	-0.075 (0.039)†	-0.013 (0.029)	0.005 (0.061)
CSSO Elected, $\beta 014$	-0.021 (0.047)	-0.086 (0.024)***	0.153 (0.049)**	-0.569 (0.098)***	-0.003 (0.028)	0.096 (0.076)	0.170 (0.047)***	-0.213 (0.042)***	0.406 (0.087)***

Legend: Negative, Significant | Negative, Not Significant | Positive, Significant | Positive, Not Significant

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