TEACHERS UNION INFLUENCE ON ALTERNATIVE TEACHER CERTIFICATION
POLICIES: AN EVENT HISTORY DIFFUSION ANALYSIS

Wenda Sheard, B.A., J.D.

Dissertation Prepared for the Degree of

DOCTOR OF PHILOSOPHY

UNIVERSITY OF NORTH TEXAS

August 2004

APPROVED:
J. Donald Smith, Major Professor
Roberto E. Trevino, Minor Professor
James S.C. Battista, Committee Member
Emily Clough, Committee Member
Al Bavon, Committee Member
James D. Meernik, Chair of the Department of
   Political Science
Sandra L. Terrell, Dean of the Robert B. Toulouse
   School of Graduate Studies

I examine the passage of alternative teacher certification policies in the states between 1975 and 2000 using event history analysis and supplementing the event history analysis with an ordinary least squares regression analysis of the strength of the alternative teacher certification policies. In order to test both teachers unions political strength external to state legislatures and teachers unions political strength internal to state legislatures, I use two variables to measure teachers union political strength. One variable measures the percentage of teachers in a state who work under union-negotiated contracts. The other variable measures the percentage of legislators in a state who list their non-legislative occupation as K-12 education. Control variables include teacher shortages, per pupil spending, legislative professionalism, divided government, democratic governor, percentage of minority students, change in percentage of minority students, an electoral threat index, and a time counter.

Although the event history model results were inconclusive with respect to the teachers union political strength variables, the policy strength model results reveal that states with large percentages of teachers who work under union-negotiated contracts are more likely than other states to pass weak alternative teacher certification policies. This result supports the notion that teachers unions operate in the education policy-making arena.
ACKNOWLEDGMENTS

I owe a debt of gratitude to all my current committee members, to my original major professor, Dr. Kenneth Godwin, and to my original minor professor, Dr. Frank Kemerer.

I met Drs. Godwin and Kemerer in the fall of 1998 when I was exploring the possibility of a degree in education policy. The two of them showed me the benefits of learning education policy through the many lenses and tools of political science, as well as through scholarly works in the field of education. Were it not for their patience, understanding, and encouragement, I would not have begun the long and rewarding journey into the worlds of political science and education policy.

I also owe a debt of gratitude to my husband, Richard Thieret, for his kind support and encouragement, and to our children Sarah, Adrian, and Anna, for allowing me to pursue my own interests during their formative years. One slogan sums up my reasons for enjoying an active life beyond the traditional bounds of motherhood: “Be what you want your children to become.”
<table>
<thead>
<tr>
<th>TABLE OF CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGMENTS .............................................................................................................. ii</td>
</tr>
<tr>
<td>LIST OF TABLES......................................................................................................................... vi</td>
</tr>
<tr>
<td>Chapter</td>
</tr>
<tr>
<td>I. INTRODUCTION ....................................................................................................................... 1</td>
</tr>
<tr>
<td>A Personal Story ................................................................................................................. 1</td>
</tr>
<tr>
<td>A Political Story ................................................................................................................. 2</td>
</tr>
<tr>
<td>Theory, Methods, Data, and Results ................................................................................... 3</td>
</tr>
<tr>
<td>Theory ..................................................................................................................... 4</td>
</tr>
<tr>
<td>Data and Methods ................................................................................................... 6</td>
</tr>
<tr>
<td>Results ..................................................................................................................... 7</td>
</tr>
<tr>
<td>A Research Assumption ...................................................................................................... 8</td>
</tr>
<tr>
<td>A Call for Problem-Driven Research .................................................................................. 9</td>
</tr>
<tr>
<td>II. THEORY AND LITERATURE REVIEW.............................................................................. 10</td>
</tr>
<tr>
<td>Introduction ....................................................................................................................... 10</td>
</tr>
<tr>
<td>Teachers Unions: An Historical Perspective .................................................................... 11</td>
</tr>
<tr>
<td>A Brief History of Teachers Unions ............................................................................. 11</td>
</tr>
<tr>
<td>A Brief History of Teachers Union Collective Bargaining ...................................... 13</td>
</tr>
<tr>
<td>The Dual Roles of Teachers Unions ............................................................................ 14</td>
</tr>
<tr>
<td>The Political Strength of Teacher Unions ..................................................................... 16</td>
</tr>
<tr>
<td>A Possible Decline in the Political Strength of Teachers Unions ................................ 19</td>
</tr>
<tr>
<td>Conclusion: An Opportunity to Gather Empirical Evidence ...................................... 21</td>
</tr>
<tr>
<td>Internal vs. External Theories of the Public Policy Process ......................................... 21</td>
</tr>
<tr>
<td>Teachers Unions and Policy Process Theories (External) ....................................... 23</td>
</tr>
<tr>
<td>Teachers Unions and Kingdon’s Multiple Streams Theory ..................................... 24</td>
</tr>
<tr>
<td>Teachers Unions and Baumgartner and Jones’s Punctuated Equilibrium Theory ...... 25</td>
</tr>
<tr>
<td>Conclusion: Teachers Unions and the Two Policy Process Theories ....................... 27</td>
</tr>
<tr>
<td>Teachers Unions and Legislative Composition Theories (Internal) ......................... 28</td>
</tr>
<tr>
<td>Teachers Unions and Weingast and Marshall’s Distributional Theory .................... 29</td>
</tr>
<tr>
<td>Teachers Unions and Krehbiel’s Information Theory ............................................. 30</td>
</tr>
<tr>
<td>Conclusion: Teachers Unions and the Legislative Composition Theories .............. 31</td>
</tr>
<tr>
<td>Bureaucratic Control Theory ............................................................................................ 32</td>
</tr>
<tr>
<td>Conclusion ........................................................................................................................ 34</td>
</tr>
<tr>
<td>III. THE POLICY PROBLEM: ALTERNATIVE TEACHER CERTIFICATION ................. 36</td>
</tr>
<tr>
<td>Introduction ....................................................................................................................... 36</td>
</tr>
<tr>
<td>Alternative Teacher Certification: A Primer ......................................................... 37</td>
</tr>
<tr>
<td>Alternative Teacher Certification: A Growing Phenomenon .................................... 38</td>
</tr>
<tr>
<td>Alternative Teacher Certification: Perceived Benefits and Detriments .................... 39</td>
</tr>
</tbody>
</table>
# Table of Contents

The Abell Foundation Report ........................................................................................... 41
Federal Endorsements of Alternative Teacher Certification ............................................ 43
Teachers Unions’ Reactions to Alternative Teacher Certification ................................... 45
Conclusion ........................................................................................................................ 48

## IV. METHODS

Introduction....................................................................................................................... 50
Hypotheses ........................................................................................................................ 52
The Two Main Models...................................................................................................... 53
  The Probit Event History Analysis Policy Diffusion Model ................................ 53
  The Ordinary Least Squares Regression Policy Strength Model.......................... 54
Event History Analysis ..................................................................................................... 54
  The Basics of Event History Analysis .................................................................. 55
  Measuring Time Variation.................................................................................... 56
  The Events: Passages of Alternative Teacher Certification Policies .................... 58
  Units of Observation, Left-Censoring, and Right-Censoring ............................... 60
  Measuring Diffusion of the Policy Innovation ..................................................... 61
  Data Collection Interpolation and Extrapolation ................................................. 64
  Event History Analysis: Using Probit or Logit or Clog-Log................................. 64
Supplementations of the Event History Analysis Technique ........................................... 65
  Using Policy Strength as a Dependent Variable ................................................ 65
  Using A Large Matrix of Statistical Results to Analyze Time Periods ................ 66
Examining Legislative v. Bureaucratic Policy Differences.............................................. 66
Conclusion ........................................................................................................................ 67

## V. DATA

Introduction....................................................................................................................... 69
Dependent Variables......................................................................................................... 69
  The Event History Analysis Model Dependent Variable ..................................... 69
  The Policy Strength Model Dependent Variable .................................................. 71
Independent Variables ...................................................................................................... 74
  The Teachers Union Independent Variables......................................................... 74
  The Diffusion of Innovation Independent Variables ............................................ 79
  The Teacher Shortage Independent Variable ......................................................... 81
  The Economic Independent Variables ................................................................. 82
  The Legislative Professionalism Independent Variable ...................................... 84
  The Divided Government and Democratic Governor Dummy Variables .......... 85
  The Electoral Threat Index Independent Variable ................................................. 85
  The Percentage of Minority Students Independent Variables .......................... 86
  The Legislative vs. Administrative Policy Dummy Independent Variable .......... 88
Data Preparation & Diagnostics........................................................................................ 88
  Checking for Outliers............................................................................................ 88
  Checking for Normal Distribution.......................................................................... 90
  Checking Normality of Residuals......................................................................... 90
  Checking for Heteroskedasticity of Residuals..................................................... 91
  Checking for Multicollinearity ............................................................................. 91
LIST OF TABLES

TABLE 1. Summary Statistics and Sources of Variables Used in the Event History Analyses

TABLE 2. Summary Statistics and Sources of Variables Used in the Policy Strength Analysis

TABLE 3. Event History Model

TABLE 4. Policy Strength Model

TABLE 5. Pseudo $R^2$'s and Number of Observations from Probit Analyses Using Data from Various Time Periods

TABLE 6. List of The Year of Passage and Strength of Each State’s First Substantial Alternative Teacher Certification Policy

TABLE 7. Difference of Means Tests on Policy Strength Variable (Dividing States Based on Legislative vs. Administrative Enactment Dummy Variable)

TABLE 8. Difference of Means Test on Legislative vs. Administrative Dummy Variable (Dividing Dataset Based on Strong vs. Weak Policy Variable)

TABLE 9. Running Separate Event History Models (Dividing Dataset by Strength of the Policy (Strong or Weak))

TABLE 10. Running Separate Event History Models (Dividing Dataset by Type of Enactment (Legislative or Administrative))
CHAPTER I

INTRODUCTION

A Personal Story

When I majored in English as an undergraduate, I rejected frequent suggestions that I earn a teaching certificate in addition to my English major. I wanted the power and money and prestige of being an attorney; I did not want to be only a teacher, unless I was a law professor like my father. To me, my choice was a matter of principle; women needed to break into lucrative and respected male-dominated fields such as law, business, and medicine. I was determined to avoid the female ghetto of teaching.

Funny, but I married a high school teacher. After years of practicing law and teaching business law at Ohio University, I discovered I love teaching more than I love practicing law. My husband, who had a dream of us becoming a teaching couple at an international school, suggested that I look into earning a teaching certificate. Even though I was already teaching successfully at Ohio University, the Ohio University College of Education insisted I needed two years of undergraduate coursework before I could teach high school students.

I found solace in Ohio University Professor Aimee Howley’s book, *Out of Our Minds: Anti-Intellectualism and Talent Development in American Schooling* (Howley, Howley, and Pendarvis 1995). Professor Howley and her co-authors note that college of education students, on average, have standardized test scores lower than those of most other college students (Howley, Howley, and Pendarvis 1995, 53). The authors also note that a negative correlation exists between teachers’ academic ability and their tenure as teachers. The college coursework and reading interests of most teachers “suggest that, on average, teachers do not have well-developed academic interests” (Howley, Howley, and Pendarvis 1995, 56). By contrast, in the
case of outstanding teachers, “compulsion to study subject matter appears to precede their choice to teach” (Howley, Howley, and Pendarvis 1995, 56).

In the years since I left Ohio University, I have compulsively studied education policy subject matter. I have also taught as a substitute teacher in a public high school for at-risk students and as a teacher in an independent boarding school for academically talented students. This summer my husband’s dream comes true; we are moving to Hangzhou, China to teach in an international school.

I still do not have a teaching certificate. What I have is a profound skepticism of our traditional teacher certification system.

A Political Story

The U.S. Department of Education shares my skepticism of our traditional teacher certification system. In the 2002 report “Meeting the Highly Qualified Teacher Challenge; The Secretary’s Annual Report on Teacher Quality,” U.S. Secretary of Education Rod Paige writes, “our system allows too many poorly qualified individuals into the classroom while creating barriers for the most talented candidates” (U.S. Department of Education 2002, 12). Paige notes that the rigidity of certification requirements imposes high opportunity costs on prospective teachers (U.S. Department of Education 2002, 15). Paige further notes that prospective teachers “might also be discouraged by the lack of rigor of the courses offered in many schools of education” (U.S. Department of Education 2002, 15).

In his second annual report, Paige continues his plea for high standards for teachers and low barriers for entry into the teaching profession (U.S. Department of Education 2003). He suggests that states could allow prospective teachers by-pass many barriers imposed by state certification requirements and college of education requirements (U.S. Department of Education

Who has blocked attempts to reform teacher certification policy? During the early 1980s, when alternative teacher certification policies began to appear in several states, education policy writers acknowledged the power of teachers unions to block education reforms. Pellicano (1980) argues, “at this point in history, significant school reform is not possible without the support of teacher unionism.” Lieberman (1984) writes, “public sector bargaining poses insuperable obstacles to the educational reform movement.” Boyton and Lloyd (1985) note, “the NEA has been the single biggest obstacle to educational reform in this country.”

More recently, education policy experts have noticed a decline in the power of teachers unions to oppose teacher certification reform. The decline in power has occurred, in part, due to economic supply and demand pressures; simply put, schools have had difficulty filling teaching vacancies with qualified applicants (Kerchner, Koppich, and Weeres 1997). Despite teacher shortages, teachers unions continue to oppose non-traditional forms of certification except those non-traditional forms that closely resemble traditional forms (Hess 2004; Feldman 1998, 2002; American Federation of Teachers 2000).

Theory, Methods, Data, and Results

In this dissertation, I explore the role of teachers unions in the political process. In particular, I examine the role teachers unions played in the passage of alternative teacher certification policies in the states.
For purposes of this dissertation, I focus on the self-interested role of teachers unions; I do not explore whether, how, or to what extent teachers unions promote policies that are good for children and society in general. I am not concerned with whether teachers union power is “good” or “bad” for education. I am concerned only with whether and to what extent teachers union power exists in the states. I focus on whether teachers unions have exerted political power to stop state legislatures and administrative agencies from enacting alternative teacher certification policies designed to give people easier access into the teaching profession and designed to give school districts a larger pool of applicants from which to fill vacant teacher positions.

I am also not concerned with whether alternative methods of teacher certification are better or worse than traditional methods of teacher certification. My research does not involve any examination of the merits or detriments of alternative teacher certification policies and programs. Likewise, my research does not involve any examination of the merits or detriments of traditional methods of teacher certification. I confine my research to political questions about the passage and strength of alternative teacher certification policies in the states.

Theory

I think that teachers unions help to elect union-friendly representatives to state legislatures, to pass union-friendly legislation and administrative regulations, and to oppose legislation and administrative regulations unfriendly to unions. To test my theory, I examine the passage of alternative teacher certification policies in the states between 1975 and 2000 using event history analysis and supplementing the event history analysis with a regression analysis of the strength of the alternative teacher certification policies.

I hypothesize that alternative teacher certification policies diffused first into states with comparatively low percentages of legislators who list their non-legislative occupation as K-12
education and into states with comparatively low percentages of teachers who work under union-negotiated contracts, and later into states with comparatively high percentages of legislators who list their non-legislative occupation as K-12 education and into states with comparatively high percentages of teachers who work under union-negotiated contracts.

I also hypothesize that states with comparatively large percentages of legislators who list their non-legislative occupation as K-12 education and states with comparatively large percentages of teachers who work under union-negotiated contracts are more likely than other states to pass strong alternative teacher certification policies. I consider policies to be strong if their rigor resembles that of traditional teacher certification programs. The strongest policies attract well-educated people from fields other than education into teaching, are not restricted to subject matter or geographic areas of shortages, and involve formal instruction and mentorship for new teachers.

Although some alternative teacher certification policies are passed by state legislatures and others are passed by state administrative agencies, in my analyses I treat all policies as if they were passed by the state legislature. I justify treating all the policies in this manner because I presume that state legislatures exercise control over administrative agencies.

Rather than rely on blindly this presumption, however, I review the bureaucratic control literature and test two bureaucratic control hypotheses. I hypothesize that state legislatures exercise control over state education administrative agencies and thus prevent those agencies from passing weak alternative teacher certification policies that represent a large departure from traditional methods of teacher certification. In the alternative, I hypothesize that state legislatures exercise control over education administrative agencies and thus prevent those agencies from
passing alternative teacher certification policies except weak policies that serve primarily as stop-gap measures.

Data and Methods

To test my theories, I examine both the diffusion and the strength of alternative teacher certification policies passed in the states from 1975 to 2000. I employ event history analysis using the Stata® version 8 probit procedure for the diffusion model. Stata® is owned by the Stata Corporation of College Station, Texas (StataCorp 2003). I use the event history analysis dataset but employ ordinary least squares regression analysis for the policy strength model. In order to interpret the statistical results, I use CLARIFY: Software for Interpreting and Presenting Statistical Results version 2.1 by Tomz, Wittenberg, and King (2003) of Cambridge, Massachusetts for the reasons explained in King, Tomz, and Wittenberg (2000).

My dependent variable for the event history analysis consists of a dummy variable indicating whether or not a state has passed an alternative teacher certification policy in a given year. I use two variables designed to measure the influence of teacher unions: (1) the percentage of teachers who work under union-negotiated contracts and (2) the percentage legislators in each state who list their non-legislative occupation as K-12 education. My control variables include measures of educational, economic, and political factors particular to each state including teacher shortages, per pupil spending, legislative professionalism, divided government, governor party affiliation, electoral threat, percentage of minority students, and change in percentage of minority students. I try various diffusion measures in my event history analysis model including the number and proportion of adjoining states and regional states that previously adopted alternative certification policies. When data points are not available for all years of my study, I follow the
standard practices, including interpolation and extrapolation, to estimate the data points (Allison 1984).

My dependent variable for the policy strength regression analysis consists of a measure of the strength of the alternative certification policies. I create the strength measure by combining information about alternative teacher certification policies in the fifty states by Feistritzer and Chester (1998, 2001) with ratings by experts of alternative teacher certification policies in the fifty states from the Fordham Foundation (Finn, Kanstoroom and Petrilli 1999). My unit of observation for the policy strength model is each state. Because half of the states had adopted alternative teacher certification policies either during or before 1989, I use 1989 values for the independent variables in the policy strength model.

In addition to supplementing my event history analysis with a policy strength regression, I run event history models separately for those states that passed strong alternative teacher certification policies and for those states that passed weak alternative certification policies. I also run a difference of means tests for the two sets of state-years. I supplement my event history analysis with an examination of the differences between policies passed by state legislatures and policies passed by state administrative agencies. For this examination, I run a series of four models, dividing the dataset two ways based on whether the policy was passed by the state legislature or by a state administrative agency and based on whether the policy was strong or weak.

Results

I find some evidence of teachers union political control. In particular, I find evidence that states with high percentages of teachers who work under union-negotiated contracts are more likely than other states to pass weak alternative teacher certification policies. I also find some
evidence that state legislatures exercise control over education administrative agencies by preventing those agencies from passing alternative teacher certification policies except weak policies that serve primarily as stop-gap measures.

A Research Assumption

At this juncture, I note that benefits and risks exist whenever political scientists use the fifty states and their legislatures or their policy processes as laboratories for studying politics. The main benefit is increased external validity; the main risk is decreased internal validity. The more states and legislatures we study, the less we know about individual states and legislatures.

Many scholars have defended their study of state legislatures and state policy processes. In *A Tools of the Trade Look at Comparing Congress with State Legislatures*, Hamm and Squire (2001) note that because the U.S. Congress and state legislatures share basic structural similarities, we can assume that the legislative processes in all will be sufficiently similar that we can expect that theories developed in one will be applicable to all. In *Agendas and Instability in American Politics*, Baumgartner and Jones note that many scholars consider the states as laboratories of democracy, worth studying because they “move ahead to solve problems that have not been raised to the national agenda” (Baumgartner and Jones 1993, 240).

In this dissertation, I join Hamm and Squire in assuming that policy processes in and around the U.S. Congress and the fifty states are sufficiently similar that the policy process theories applicable to one will be worth examining in all. I also join Baumgartner and Jones in assuming that a study of state policy processes in the area of alternative teacher certification will provide information valuable to policy makers on the federal level.
A Call for Problem-Driven Research

I hope that this dissertation satisfies American Political Science Association President Robert Putnam’s plea in his 2003 article *APSA Presidential Address: The Public Role of Political Science*. Putnam believes that political scientists ought to attend to concerns of fellow citizens (Putnam 2003). He agrees that science must consist of portable, testable knowledge, and theory-driven, empirically tested work. He warns political scientists, however, that there is a large gap between our knowledge and our citizens’ needs for answers. He writes, “I seek a more problem-driven political science—not instead of our more recent method-driven political science, but alongside it, relying on, not rejecting, the valuable analytic tools that we have fashioned” (Putnam 2003, 253). Putnam acknowledges that there are risks involved in attending to the concerns of fellow citizens, but he urges political scientists to accept the risks. He writes, “Frankly, the greater risk is not that contributions of political science to public life will be controversial, but that they will be ignored” (Putnam 2003, 253).

With Putnam’s plea in mind, I began this dissertation. I hope that this dissertation consists of portable, testable knowledge, and theory-driven, empirically tested work. I also hope that this dissertation consists of information useful to citizens engaged in education policy-making. In particular, I hope this dissertation informs education policy debates about teacher union strength and alternative teacher certification policies.
CHAPTER II
THEORY AND LITERATURE REVIEW

Introduction

I think that teachers unions play a role in the election of union-friendly representatives to state legislatures, in the passage of union-friendly legislation and administrative regulations, and in the opposition of legislation and administrative regulations unfriendly to unions.

Most political science scholars and most education policy scholars agree that teachers unions have played a large role in education politics for a great portion of the time since their beginnings nearly 150 years ago. Even our current United States Education Secretary Rod Paige presumes the political power of teachers unions: Paige recently called the National Education Association (NEA) a “terrorist organization” (Dillon and Schemo 2004). After the NEA called for President George W. Bush to fire Paige, Paige apologized for his choice of words, but once again spoke about the power of the teachers union, this time by stating that the union employs “obstructionist scare tactics” in the political arena (National Education Association 2004).

In this chapter, I first examine the role teachers unions play in the political process from a historical perspective. After the historical examination, I discuss how my theory about the large role of teachers unions in the political process fits into interest group literature, agenda-setting policy process literature, and legislative committee composition literature. Because some alternative teacher certification policies are passed by state legislatures and others are passed by state administrative agencies, I also review the bureaucratic control literature about concordance between bureaucratic and legislative decision-making.
I find that theories from interest group literature, agenda-setting policy process literature, and legislative committee composition literature all predict that teachers unions play a large role in the political process.

Teachers Unions: An Historical Perspective

A Brief History of Teachers Unions

Murphy (1990) notes that the history of teachers unions differs from the history of other unions in several significant respects: most teachers are college-educated women, most teaching jobs are public employment, and most teachers are not well paid. Indeed, the majority presence of women in the profession, the fact that teaching is a profession, and the fact that most teachers are employed by public bodies make the history of teachers unions unique from the history of other unions. The history of teachers unions is further complicated by the fact that there are hundreds of teachers unions in the United States, 75% of which operate politically in only one state (Wolak et al. 2002). In this section, I limit my discussion to a brief history of the two primary teachers unions in our country—the American Federation of Teachers (AFT) and the National Education Association (NEA)—and a brief description of their collective bargaining and political activity.

Murphy (1990) notes that the AFT finds its roots in a small group of rebellious urban teachers in Chicago, Illinois who opposed the movement toward centralization of neighborhood schools. Because centralization threatened neighborhood schools, community members supported the teachers’ opposition against centralization. School board members, however, grew to oppose the activities of the Chicago Teachers Federation.

In 1915 Chicago Board of Education President Jacob Loeb and a commission of the Illinois Legislature sought to stop members of the Chicago Teachers Federation. Loeb and his
legislative cohorts targeted the Chicago teachers in part due to their political abilities. Loeb
denigrated one leader of the Chicago Teachers Federation by calling her “an astute and designing
politician” who was “contemptuous and rebellious towards those in authority” (Murphy 1990,
82–83). Loeb and his cohorts worried that unionized teachers might teach children “to be
dissatisfied, contemptuous, and rebellious towards authority” (Murphy 1990, 83).

In 1915 the Chicago Board of Education passed the Loeb Rule, which challenged the idea
of teacher unionism. The rule stated that teachers who belong to unions would not be rehired
(Murphy 1990, 81). At the time, the board of education was composed of businessmen who
presumably disliked union activity in businesses as well as in schools.

In 1916 the Chicago Board of Education fired 35 teachers, most of whom were members
of the Chicago Teachers Federation. After the firings, Chicago Teachers Federation members,
with the support of teacher groups from New York City, Atlanta, St. Paul, and Washington,
formed the AFT and affiliated with the American Federation of Labor (AFL). In 1917 the Illinois
Supreme Court upheld the Loeb Rule. The Loeb Rule and similar rules in other states limited the
union power of the AFT (Murphy 1990).

The AFT describes its 1916 founding as follows:

In 1916, a handful of teachers met in the basement of a teacher’s home in
Winnetka, Ill. What brought them together was the belief that they needed a new
national organization that would be committed to their professional interests,
would benefit the people they served, and would work to create strong local
unions affiliated with the labor movement. The organization they forged is the
American Federation of Teachers.

(American Federation of Teachers 2004)

The National Education Association (NEA) began in 1857 not as a teachers union, but
rather as a national organization composed primarily of male school administrators interested in
advancing education as a profession. According to one source, however, the presidents of ten
state teachers associations called the 1857 founding meeting in Philadelphia (Blumenfeld 1984, 19). For over one hundred years, the NEA was a primarily a professional organization rather than primarily a teachers union. Although some teachers joined the NEA in the early years, the NEA did not begin to actively recruit teachers unto its ranks until 1916 (Murphy 1990, 4).

Although the membership and activities of the NEA have changed over the years, the NEA claims its current mission remains true to its founding mission:

Founded in 1857 "to elevate the character and advance the interests of the profession of teaching and to promote the cause of popular education in the United States," the NEA has remained constant in its commitment to its original mission as evidenced by the current mission statement:

“To fulfill the promise of a democratic society, the National Education Association shall promote the cause of quality public education and advance the profession of education; expand the rights and further the interest of educational employees; and advocate human, civil, and economic rights for all.”

(National Education Association 2004)

A Brief History of Teachers Union Collective Bargaining

Neither the AFT nor the NEA embraced the idea of collective bargaining during their early years (Urban 2000, 171; Murphy 1990, 210). After World War II, however, the AFT successfully advocated for collective bargaining. Through the 1950s, teachers unions gradually began to strike in support of collective bargaining. The 1962 New York City one-day teachers strike on election day resulted in the first collective bargaining agreement for teachers in this country (Krueger 2002). The strike led to a rise in teacher militancy and collective bargaining in the 1960s (Murphy 1990, 214).

During the 1960s, many states passed laws permitting collective bargaining by public school teachers (Krueger 2002). After the passage of collective bargaining laws, teachers unions
increased in size. The NEA changed from being a non-confrontational professional association to being a union actively engaged in collective bargaining (Urban 2000).

Teachers union membership has continued to increase. By the late 1970s, “72% of all public school teachers were members of some form of union” (Murphy 1990, 209). The NEA claims 2.7 million members; the AFT claims 1.3 million members. Thirty-five states have laws permitting collective bargaining by teachers (Krueger 2002). A national survey conducted by the public research organization Public Agenda in 2003 found that 83% of teachers rated their unions as “absolutely essential” (Galley 2003).

Teachers consider the local-level collective bargaining aspects of their union as essential; they do not consider the political aspects of their unions to be essential (Galley 2003). One author of the survey report states, “When we asked [teachers] to rate the various services of the union, the political end of it was one of the least important things to them” (Galley 2003).

The Dual Roles of Teachers Unions

Teachers unions provide collective bargaining services, political services, and many other services to their members. When providing services to their members, teachers unions typically play either a self-interested role of a union protecting members’ interests or a larger role of a professional association protecting children and society as a whole. In this section I discuss the dual roles of teachers unions.

Although the AFT began primarily as an advocacy group and the NEA began primarily as a professional association rather than a union, both groups have had internal struggles between their “union” aspects and their “professional association” aspects. There are teachers in both groups who believe their group should promote policies primarily beneficial to children and society over policies primarily beneficial to teachers. Likewise, there are teachers in both groups
who believe their group should promote policies primarily beneficial to teachers over policies primarily beneficial to children and society as a whole.

When the NEA lost members to the AFT in New York and in other places during the 1960s, the NEA shifted its orientation from a professional organization orientation to a union orientation. In the process, the NEA attempted to increase the membership rolls of local affiliates, thus shifting its focus from a national organization to a collection of local organizations willing and able to advocate for teachers (Murphy 1990, 222). Murphy notes that although the AFT began with a union orientation and the NEA began with a profession association orientation, “the association and the union have nearly switched roles, with the NEA taking bolder, more progressive positions on a range of social issues, while the union [the AFT] looks for creative yet conservative solutions to educational problems” (Murphy 1990, 272).

Loveless (2000) notes that many teachers unions began along the lines of industrial unions, but also note that due to changes in the political environment during the past twenty years, many teachers unions have had to switch to a more reform-oriented and professional-oriented role. Johnson and Kardos (2000) note how state education reform efforts in the early 1980s forced teachers unions to adopt new approaches to collective bargaining—approaches that involve directly addressing education reforms in union contracts.

The AFT and the NEA both embrace their dual roles—one role as advocate for the self-interest of their teacher-members and the other role as advocate for their students and society in general. They have embraced both roles in various degrees from their beginnings until the present time. Johnson and Kardos (2000) contend that unions can blend both their self-interested role and their education professional role by directly addressing education reforms in union contracts.
The Political Strength of Teacher Unions

Despite widespread belief that teachers unions wield considerable political power and
despite the large percentages of teachers union members and the large size of teachers union
coffers, little empirical evidence exists either in the field of education or in the field of political
science to support that belief.

Neither the AFT nor the NEA began with headquarters in Washington. The AFT, which
had its genesis in local teacher organizations, focused on local level politics for many years. The
AFT did not move its headquarters to Washington or lobby in a significant manner on the
national level until the early 1950s. The NEA has had a presence in Washington since the 1920s,
but did not emphasize local chapters until the 1960s (Murphy 1990).

The 1972 creation of the NEA political action committee (NEA-PAC) and the 1973
revision of the NEA constitution helped transform the NEA into a political organization (Urban
2000, 184). In its first year, NEA-PAC spent $30,000 on political campaigns and NEA sent over
25,000 members to work on congressional campaigns.

By 1984, the NEA had $375 million for campaign spending, which was more money than
the entire rest of the labor movement had for campaign spending, and had 500,000 NEA
volunteers working for Jimmy Carter (Berube 1988). By 1985, the NEA employed 1,172 fulltime
organizers and “an army of lobbyists in Washington, D.C. and in each of the fifty state
legislatures” (Jasper 1985). In 1986, 80% of congressional candidates backed by the NEA and
the AFT won election. Teachers unions also had success supporting school board and state
legislature candidates during the 1980s (Jasper 1985).
Teachers unions remain strong today. According to one study, in 1996 NEA and NEA affiliate income exceeded $1 billion and the NEA had thousands of full-time politically active employees (Haar 2002, 77).

Lieberman (2000) comments that teachers unions “play an extremely influential role not just in education but in politics and the economy as well.” In his earlier book, Lieberman discusses the power of teacher unions in terms of “producer domination” of the education market, including domination of matters unrelated to the conditions and benefits of teaching jobs (Lieberman 1993, 53-66). Although Lieberman supports his later book with tables and appendices showing political action committee (PAC) figures documenting how much money teachers unions collect from their members and distribute to political candidates, Lieberman does not link his argument to existing political science theories and does not provide empirical evidence linking the PAC money to education policy influence.

Other books by those involved in the field of education similarly describe teachers union power but do not provide empirical support for the existence of that power. Buss (1999) presumes the power of teachers unions. He writes about the NEA and the AFT: “Like other unions, these organizations are active participants in the political process at all levels, and because of their numbers, their political influence is often significant” (Buss 1999, 301).

Blumenfeld (1984) argues that the NEA is “the biggest lobby in Washington” and describes the NEA-PAC as a “Political Octopus in the Making” (Blumenfeld 1984, 163). Blumenfeld writes, “public school teachers, once loved and respected for their devotion to their profession, have become militantly politicized and are now the most active and powerful advocates of the political agenda of the radical left” (Blumenfeld 1984, x). Blumenfeld, however,
Kerchner, Koppich, and Weeres (1997) appear to agree that teachers unions have great power, but disagree on whether teachers unions use that power to help or to hurt education in our country. Loveless notes that Lieberman (1997) and Kerchner, Koppich, and Weeres (1997) offer “dramatically opposing answers” to the question of whether teachers unions help, hurt, or make no difference in the quality of education. Lieberman contends teachers unions hurt education; Kerchner, Koppich, and Weeres contend teachers unions help education. Loveless further notes that there is a “surprisingly small body of literature evaluating the impact of teachers unions on American education” (Loveless 2000, 1). I understand Loveless’s statement here to be primarily indicative of the dearth of empirical evidence proving the existence of teacher union power, not primarily indicative of the dearth of evidence proving whether that power is good or bad for American education.

There is some empirical evidence that teachers unions have political strength. Boyd, Plank and Sykes (2000) detail what happened to teachers unions in Michigan and Pennsylvania when the state legislatures took drastic measures that greatly reduced teachers union political power in those states. Boyd, Plank and Sykes employ a prisoners’ dilemma model to demonstrate that states and teachers unions can win more by adopting cooperative strategies rather than by fighting over education policy power.

Stone (2000) cites Chubb and Moe’s (1990) findings and he surveys other evidence about the effect of teachers unions on public schools. He concludes that teachers unions have increased education costs, as the public believes, but contrary to public belief student achievement does not decrease as a result of the presence of teachers unions. Empirical work by Steelman, Powell, and
Carini (2000) and Nelson, Rosen, and Powell (1996) also support the proposition that teachers unions increase student achievement.

Ballou and Podgursky (2000) note a growing trend among teachers unions to seek control of their own licensing and certification standards in a manner similar to the control that doctors, lawyers, and many other professionals have over their own training and licensure. The teachers unions argue that teachers themselves should have control over certification processes (Ballou and Podgursky 2000; Zeichner and Schulte 2001). Chubb and Moe (1990) observe that self-regulating boards of all types “tend to use public authority in their own self-interest to restrict entry and enhance their incomes.”

A Possible Decline in the Political Strength of Teachers Unions

Despite the push by teachers unions for national teacher certification controlled by teacher organizations, during the past twenty years state legislators have voted for alternative teacher certification policies that not only continue state control of certification, but also loosen certification requirements to a point where many educators decry the practice (Buck, Polloway & Robb 1995). Some educators write that “filling schools with minimally committed, untrained dilettantes destroys all hope of making teaching a full-fledged profession” (Clabaugh 1999).

Darling-Hammond (2000) concludes that measures of traditional teacher preparation and certification are the strongest correlates of student achievement in reading and mathematics. She criticizes the hiring of teachers without traditional certification and argues in favor of teacher-run standards boards, which are currently in existence in approximately a dozen states.

Kerchner, Koppich, and Weeres (1997, 34) contend that teachers unions have been vulnerable in recent years because they are “utterly dependent on the existing structure and power alignments within public education: a massive, rule-bound, hierarchical public
bureaucracy that is increasingly seen as anachronistic and ill-fitted to the requirements of post-industrial society.” They argue “unions appear strong because they are the most stable and well-organized constituents of the existing institution of education” (Kerchner, Koppich, and Weeres 1997, 33).

Kerchner and Koppich (2000) allude to a slow decline in teachers union political power during recent years. They write, “by focusing their rhetoric on demonizing unions, both public officials and policy analysts miss the larger issue of what kind of unionism is wanted” (Kerchner and Koppich 2000, 283). Kerchner and Koppich advocate that teachers unions organize more on a professional model than on an industrial model. They also advocate changes in labor law that would permit cooperation between teachers unions and schools.

The decline in the power of teachers unions to oppose certification reform in recent years has occurred, in part, due to economic supply and demand pressures; simply put, schools have had difficulty filling teaching vacancies with qualified applicants. Kerchner, Koppich, and Weeres (1997) compared “strict certification rules” pressure from teachers unions to “easy certification rules” pressure from the forces of supply and demand. They conclude, “of the two pressures, supply and demand is always the stronger” (Kerchner, Koppich, and Weeres 1997, 170).

I return to this theme of declining teachers union power in the results chapter, but at this point I note that although my theory is that teachers unions have significant political power, my research focuses on what might be characterized as a slow decline of that power from 1975-2000 when almost all of the fifty states adopted alternative teacher certification laws that arguably oppose the interests of teachers unions. In the results chapter I examine not only overall teachers union political strength, but also the apparent decline of that power during the period in question.
Conclusion: An Opportunity to Gather Empirical Evidence

Although many education policy writers and political science writers presume that teachers unions are among the most influential interest groups, there is little empirical evidence from the field of political science measuring the political strength of teachers unions on the state level. The alternative teacher certification policy area provides fertile ground for such an empirical study.

Internal vs. External Theories of the Public Policy Process

Research and theories about public policy process typically take one of two paths. Some researchers and theorists take the external path to studying public policy, focusing on agenda-setting. These researchers and theorists examine actors, events, and venues mostly external to legislative bodies. External policy process theories have had a long history, beginning in Madison’s federalist paper about political factions, evident in Wilson’s (1887) long-misunderstood essay on the politics and administration dichotomy, welcomed by Truman’s (1951) pluralism, divided and boxed by Lowi’s (1964, 1969) and Wilson’s (1973) typologies, and challenged by Schattschneider’s (1960) and Mill’s (1956) power elitism ideas. Most recent versions of external public policy theories include Kingdon’s (1995) multiple streams theory and Baumgartner and Jones’s (1993) punctuated equilibrium theory.

Other researchers and theorists travel the internal path, focusing on committee composition in Congress and the state legislatures. Three major theories about legislative committee composition—the informational theory by Krehbiel (1991, 1998), the distributive theory by Weingast and Marshall (1988) and the partisan theory by Cox and McCubbins (1993)—have dominated political science in recent years. All three theories attempt to explain
how and why committee composition influences which policies are passed by the legislature as a whole.

In the first chapter of the edited volume, *Policy Dynamics*, Baumgartner and Jones (2002a) note that external and internal scholars are studying different parts of the same policy process. Baumgartner and Jones note that scholars who study legislative committee composition have more success when they study institutions that are stable. They further note that scholars who focus on external policy processes have an advantage because they can study policy processes across venues. Baumgartner and Jones contend that policy process researchers should examine both internal processes and external processes (Baumgartner and Jones 2002b, 4).

Hardin (2002) gives some reasons why legislative committee composition research can benefit from insights from Baumgartner and Jones’s (1993, 2002a, 2002b) punctuated equilibrium theory of the policy process. Hardin notes that committee jurisdiction is not static over time, committees often do not hold monopolies over issues in their jurisdictions, and institutions are not exogenous to the policy process. Alder (2002) joins Hardin in calling for scholars to blend committee composition research with punctuated equilibrium research. Alder asks an important causal arrow question; what comes first—the committee’s composition or the committee’s policy agenda?

Although this dissertation does not include a direct examination of legislative committee composition in the fifty states, I refer to the internal theories as well as the external theories for several reasons. First, in the education policy arena, the internal and external theories link together in interesting ways. Second, teachers serve in state legislatures in numbers out of proportion to their numbers in the general population, and because evidence exists that education committees are composed of legislators interested in education, I predict that future research will
find that education committees of state legislatures include larger percentages of teacher-legislators than expected by random chance. Third, I agree with Baumgartner and Jones (2002b), Hardin (2002), and Alder (2002) that the best policy research should include an examination of both the internal theories and the external theories.

In the following sections, I highlight literature on external theories and internal theories and explain how those theories relate to my theory that teachers unions play a role in the election of union-friendly representatives to state legislatures, in the passage of union-friendly legislation and administrative regulations, and in the opposition of legislation and administrative regulations unfriendly to unions. Because I believe that Baumgartner and Jones’s (1993) punctuated equilibrium theory and Weingast and Marshall’s (1988) distributive committee composition theories best represent the policy process involving teachers unions, I focus primarily on those two theories.

Teachers Unions and Policy Process Theories (External)

Policy process researchers, unlike legislative committee composition researchers, do not limit themselves to examining the internal workings of legislative bodies. Policy process research generally focuses on processes external to the legislature.

In the following sections, I discuss Kingdon’s multiple streams theory of the policy process and Baumgartner and Jones’s punctuated equilibrium theory of the policy process. I compare both theories to my theory that teachers unions play a role in the election of union-friendly representatives to state legislatures, in the passage of union-friendly legislation and administrative regulations, and in the opposition of legislation and administrative regulations unfriendly to unions.
Teachers Unions and Kingdon's Multiple Streams Theory

Kingdon’s (1984, 1995) multiple streams theory identifies three “streams” that converge to result in new policy. The streams include the problem stream, the policies stream, and the politics stream. Policy change occurs when the streams merge. Kingdon (1995, xiii) describes his multiple streams theory as follows: “The process described in this book seems highly fluid and loosely coupled, various streams—problems, policies, politics—seem to flow through and around the federal government largely independent of one another, and big policy changes occur when the streams join.”

I believe that teachers unions reside within all three of Kingdon’s streams. Teachers unions call attention to problems in the education system and decide which problems merit attention. Members of teachers unions, who by definition are experts in the field of education, operate in the policy stream by virtue of that expertise. Members of teachers unions, by virtue of their political activity including political action committee contributions, candidate endorsements, voter mobilization, and election to state legislatures, operate also in the politics stream.

Because teachers unions operate within all three of Kingdon’s streams, I believe Kingdon would agree with my theory that teachers unions wield large power in the policy-making process. Kingdon’s multiple stream theory, however, seems more relevant to new policy areas than to existing policy areas. Kingdon himself describes the changes that occur through the policy streams process as “big” changes (Kingdon 1995, xiii). Kingdon’s book is replete with examples of new policy areas rather than example from modifications to existing policy areas. Although teachers union activity occasionally involves new policy areas, teachers union activity generally involves modifications to existing policy areas. For that reason, I find that Kingdon’s
theory might apply better to teachers union activity involving new policy areas than it applies to teachers union activities involving modifications to existing policy areas.

*Teachers Unions and Baumgartner and Jones’s Punctuated Equilibrium Theory*

Nine years after Kingdon (1984) published his multiple streams theory, Baumgartner and Jones (1993) published their punctuated equilibrium theory. Baumgartner and Jones note that prior models of the policy process, including Kingdon’s model, fail to recognize the importance of institutional arrangements, fail to analyze the powerful images and ideas under-girding institutional arrangements, and fail to recognize the long-run fragility of policy-monopoly arrangements. Baumgartner and Jones urge us to regard institutions not as exogenous to the policy process, but rather as elements and actors endogenous to the policy process. According to Baumgartner and Jones, the policy process involves long periods of equilibrium punctuated by periods of rapid change. When new issues emerge, policy actors create new institutions that remain in place during periods of equilibrium.

The newly created institutions result in long-term equilibrium in their policy area because the newly created institutions structure the participation of policy actors in complex systems of mutually non-interfering policy monopolies. Powerful images support the continued existence of policy monopolies and their institutional jurisdictions. Privileged groups of elites operate in particular policy monopolies, thus dominating important policy issues within those monopolies. In an effort to repel outsiders from policy monopolies, elites often claim that their policy areas are “highly complex and technical” or are “neutral” or have “unavoidable social impacts.”

Baumgartner and Jones (1993) theorize that periods of equilibrium result from negative feedback processes that repel outsiders and quell dissent in an effort to keep policy-making hidden in policy monopolies. They theorize that political power of those in policy monopolies
“stems from autonomy from the broader political system” (Baumgartner and Jones 2002b, 11).

Negative feedback processes by definition are those processes in which “as political actors invest more and more political resources into the political fray, they achieve a smaller and smaller marginal effect for their efforts” (Baumgartner and Jones 1993, 16).

Positive feedback processes, by contrast, encourage change by causing major disruptions, reorganizations, and reconfigurations of institutions. Positive feedback occurs when “small inputs can cascade into major effects as they work their ways through a complex system” (Baumgartner and Jones 1993, 16). Policy punctuations occur when friction from outside factors builds to the breaking point and thus causes a large change in policy.

During periods of positive feedback, public and elite attention might shift from one underlying element of the policy issue to another underlying element of the policy issue. Whether and when a policy equilibrium is punctuated depends on how the issues are portrayed, what symbols are used, and which institutions have jurisdiction over an issue. Periods of punctuation often include changes in intensities of interest, changes in public images associated with the policy, and changes in institutional jurisdictions. Periods of punctuation might also include emotional public campaigns capable of trumping experts including policy-analysts, lobbyists, and attorneys. Punctuations in the equilibrium occur when policy image changes and institutional changes combine to produce. Baumgartner and Jones note “policy diffusion, with its S-shaped curve, is remarkably like a punctuated equilibrium model in which the system shifts rapidly from one stable point to another (Baumgartner and Jones 1993, 17).

According to Baumgartner and Jones, political actors able to manipulate images and ideas have political power. In their 1993 book, Agendas and Instability in American Politics, Baumgartner and Jones note that political actors sometimes frame education policy debates in
economic terms, thus emphasizing what a good education system can contribute to economic growth. Other times political actors frame education policy debates in equal opportunity terms. This ability to make shifts in framing and emphasis gives education advocates, including teachers unions, power “to promote their policies in different terms, depending on the predominant view of those in power” (Baumgartner and Jones 1993, 228).

I believe that Baumgartner and Jones would agree that teachers unions play an influential role in politics. Teachers unions elect teachers to state legislatures. The teacher-legislators serve as experts on education committees. Because most other legislators cannot claim education expertise, teacher-legislators might sideline other legislators in the education policy-making process. Teachers, by using their educational expertise in legislative and other public jurisdictions, likely create negative feedback processes that reduce the marginal benefits their opponents receive from expending more and more political capital in the educational policy-making process. Because teachers unions serve not only a self-interested role, but also serve a professional role of advocating for children, teachers unions enjoy another advantage apparent in Baumgartner and Jones’s punctuated equilibrium theory of the policy process: teachers unions are able to supply the public with varied and favorable images and ideas.

**Conclusion: Teachers Unions and the Two Policy Process Theories**

I conclude that Baumgartner and Jones’s (1993) punctuated equilibrium theory does a better job than Kingdon’s (1984, 1995) of illustrating what I believe to be the power of teachers unions. I reach this conclusion for several reasons. First, although Kingdon’s theory best describes what happens in new policy areas, most teachers union activity occurs not in new policies areas but rather in the familiar policy area of education. Second, Kingdon himself says that his multiple streams theory describes how big policy changes occur. Education policy
changes are seldom big; most education policy changes are modifications of existing policy. Third, Baumgartner and Jones’s punctuated equilibrium theory relates not only to the self-interested role of teachers unions, but also relates to the professional role of teachers. Fourth, Baumgartner and Jones’s theory predicts that teacher-legislators likely monopolize educational policy and foster negative feedback processes, thus creating equilibrium.

Kingdon appears to agree that his multiple streams theory comports with Baumgartner and Jones’s punctuated equilibrium theory. In the 1995 edition of his Agendas, Alternatives, and Public Policies, Kingdon (1995, 226) agrees with Baumgartner and Jones (1993, 3-24) that the multiple streams agenda-setting theory “looks like punctuated equilibrium.” Kingdon (1995, 229-230) welcomes research into the institutional endogeneity questions posed by Baumgartner and Jones. Thus, perhaps the two theories soon will blend into one theory.

Teachers Unions and Legislative Composition Theories (Internal)


Although this dissertation will not analyze committee composition data, because teachers unions often support teachers running for state legislatures and because teacher-legislators often serve on the state legislature education committees, I review the committee composition literature and I analyze what the literature might contribute to my theory about the political strength of teachers unions in education policy areas. Because I believe that Weingast and Marshall’s (1988) distributive committee composition theory best represents the policy process involving teachers unions, I focus primarily on their theory.
Teachers Unions and Weingast and Marshall’s Distributional Theory

In their distributive theory of legislative committee composition, Weingast and Marshall (1988) theorize that legislative committees are composed of high-demanding outliers, and thus legislative committees are homogeneous and do not represent the interests of the legislature as a whole. Legislators serve on committees of their interest in order to pass bills they support and stop bills they oppose. Committees are self-selecting. Legislators serving on committees engage in bargaining and vote trading, even across policy areas, in efforts to gain advantages for themselves and their constituents. The committee system solves the problem of non-simultaneous exchange and non-contemporaneous benefits because committees engage in cooperation and prevent the majority from going back on exchanges after the fact. Committees impose structure-induced equilibrium in legislatures (Shepsle 1979, 1986).

I believe Weingast and Marshall would expect that teachers unions have great strength in state legislatures. Weingast and Marshall’s distributive theory embraces the traditional view of legislators—that they serve on committees in order to seek benefits. I expect that teachers unions members who win election to state legislatures will serve on state education committees and use their positions on those committees to pass bills that teachers unions support and stop bills that teachers unions oppose.

In the same vein that Weingast and Marshall’s (1988) distributive theory might predict that teachers unions have political power because teacher-legislators serve on education committees in numbers out of proportion to their numbers in the legislature as a whole, I predict that teachers union have political power because teachers serve in state legislatures in numbers out of proportion to their numbers in the general population. Approximately 6% of state
legislators claim that their primary occupation other than legislator is K-12 education (National Conference of State Legislatures 1987, 1996).

**Teachers Unions and Krehbiel’s Information Theory**

According to Krehbiel’s (1991) information theory, committees serve the full legislature by collecting and sharing information and policy expertise about the uncertain links between policies and social outcomes. Legislators, often working through party organizations, purposely create committees that are heterogeneous and representative of the legislature as a whole. The heterogeneous character of committees limits committee members’ ability to exploit their superior knowledge of their policy areas. Legislators hope all committees will fairly and accurately develop and share policy expertise with the rest of the legislature. Committees are subservient to the legislature as a whole.

I find several reasons to suspect that my theory about the political strength of teachers unions does not follow what Krehbiel would predict pursuant to his information theory of legislative committee composition. Krehbiel (1991) provides some evidence to show that teacher-legislators might serve on committees in larger numbers than his theory predicts. He examines committee composition in the U.S. House of Representatives. He finds that the Education Subcommittee of the Labor, Health, and Human Services committee does “attract high demanders from both education and labor spectra,” but he contends the magnitude of the attraction is underwhelming—only one more education-leaning and labor-leaning member on the committee (Krehbiel 1991, 120-21). When analyzing the composition of general ideology committees, he finds that the Education and Labor Committee is more liberal (a 21.5 difference of means) than the House as a whole (Krehbiel 1991, 128-129). When analyzing the composition of policy-specific committees, Krehbiel finds that “the Education and Labor Committee appears
to be somewhat of an outlier according to the AFL-CIO’s COPE score, with 11.5% of members lying between the committee and the House medians” (Krehbiel 1991, 133).

Although Krehbiel contends his federal committee composition results are not sufficiently significant to contradict his information theory of committee composition, I believe there are several reasons to believe that state legislature education committee compositions would contradict Krehbiel’s theory. First, most education policy-making occurs on the state level, not on the federal level. Second, Krehbiel’s federal committee composition data is not from a single-jurisdiction education committee. Rather, his data is from a blended education and labor committee. Third, Krehbiel’s theory hinges in part on his “interest/expertise” distinction between putting legislators on committees in which they have an interest and putting legislators on committees in which they have expertise or can acquire expertise at low cost. In the case of teacher-educators, no such “interest/expertise” distinction exists. Teacher-legislators, who are presumably interested in education, by virtue of their training in education are also experts in education.

Conclusion: Teachers Unions and the Legislative Composition Theories

I believe that Weingast and Marshall’s distributive theory informs us about the political power of teachers unions much better than Krehbiel’s information theory informs us about the political power of teachers unions. After teachers unions promote the candidacy and election of legislators friendly to teachers unions, those legislators serve on education committees. Teachers are elected to state legislatures in numbers exceeding their proportion in the general population. Education committees have a disproportionate share of legislators interested in educational issues, including legislators with backgrounds in K-12 education.
Bureaucratic Control Theory

Although some alternative teacher certification policies are passed by state legislatures and others are passed by state administrative agencies, in my event history analysis model and in my policy strength model I treat all policies as if they were passed by the state legislature. I justify treating all the policies in this manner because I presume that state legislatures exercise control over administrative agencies. Rather than rely on blindly this presumption, however, I review the bureaucratic control literature and test two bureaucratic control hypotheses.

The body of bureaucratic control literature supports my presumption that state legislatures exercise control over administrative agencies (Weissert and Silberman 2002; Scholtz and Wood 1999; Balla 1998, Ringquist 1995). Political scientists no longer believe that bureaucratic policy-making occurs in a vacuum devoid of political influence (Wood and Waterman 1993). In a study of data from four EPA programs from 1979 to 1988, Wood and Waterman (1993) find that courts engender the quickest response from bureaucracies, but legislative committees engender the largest response from bureaucracies. In a study of time series data from seven different agencies during the late Carter and early Reagan administrations, Wood and Waterman (1991) find that the executive exercises control over the bureaucracy. Weissert and Silberman (2002), in their study of the role that state political actors play in the policy-making activities of state medical boards, find that state legislatures play the largest role.

Meier, Polinard, and Wrinkle (1999) summarize various views of the nature of political control over administrative agencies. They write that the “most common view of political institutions and their control over bureaucracy is the principal-agent model” which they characterize as a top-down form of control. Balla (1998) urges researchers to move from a principal-agent theory of administrative oversight to an agency-centered approach.
I believe that both top-down control mechanisms and agency-centered control mechanisms operate in the education policy arena. Top-down control mechanisms operate because teachers unions influence state legislatures, who in turn constrain state education administrative agencies. The agency-centered approach mechanisms might be operating because teachers unions influence state education administrative agencies directly.

I find support for both the indirect through-the-legislature type of mechanism and the direct to the administrative agency type of mechanism in literature about teachers unions. Many scholars have found that teachers unions have controlled the education policy domain in both the legislative and the bureaucratic levels for decades (Lieberman 2000; Ballou and Podgursky 2000; Buss 1999; Kerchner, Koppich, and Weeres 1997). Ballou and Podgursky note a growing trend among teachers unions to seek bureaucratic control of teacher licensing and certification standards in a manner similar to the control that doctors, lawyers, and other professionals possess over their training and licensure. The teachers unions argue that teachers should have control over certification processes (Kerchner, Koppich, and Weeres 1997; Zeichner and Schulte 2001).

For these reasons, I expect to find that state legislatures exercise control over the education bureaucracy. In particular, I expect to find that the state legislatures, influenced by teachers unions, exercise control over education administrative agencies and thus prevent those agencies from passing alternative teacher certification policies that represent a large departure from traditional methods of teacher certification (strong policies). In the alternative, I expect to find that state legislatures exercise control over education administrative agencies and thus prevent those agencies from passing alternative teacher certification policies except those policies that serve primarily as stop-gap measures (weak policies).
Conclusion

The two political science theories that blend best with my theory of teachers union political strength are Baumgartner and Jones’s punctuated equilibrium theory of the policy process and Weingast and Marshall’s distributional theory of legislative committee composition. The former theory involves processes mostly external to the legislature and the latter theory involves only processes internal to the legislature. I predict that my examination of the alternative teacher certification policy processes in the fifty states and future research along the same lines will demonstrate that not only do both theories blend well with my theory, but also the two theories blend well with each other despite the fact that one is an external theory and the other is an internal theory.

A key assumption of the punctuated equilibrium theory involves the dual nature of policy processes—there are periods of stability and there are periods of punctuation. I believe that the “punches” of punctuated equilibrium theory result in part at times when actors inside the legislature are ready to “punch.” When legislators prepare to make big policy changes, they put themselves and similarly interested legislators on target committees. Thus, in periods prior to policy punctuations, researchers will find distributional committee compositions.

My theory of blending punctuated equilibrium policy process theory and distributional legislative composition theory comports well with recent research delving deep into punctuated equilibrium theory. In their article “Policy Punctuations in American Political Institutions,” Jones, Sulkin and Larson (2003) discuss the fact that policy outputs have costs in the form of institutional friction. Institutions are “sticky” in that they do not respond simply or directly to demands and needs. Increased institutional friction results when actors push for changes. Pressure increases as friction builds. Policy punctuations release the pressure. Increased institutional friction results in increased policy punctuations. Jones, Sulkin, and Larson note that
the policy core of a legislative committee does not change until there is a big change in the preferences of the legislators on the committee.

I theorize that much of the blending of the distributional theory and the punctuated equilibrium theory that I expect to find in my research occurs due to the nature of the education policy area. The education policy area often includes features found in other high-profile policy areas—strong interest groups and widespread citizen and media attention. Teachers unions contribute money and volunteers to political campaigns. Teachers occupy legislative positions in excess of their proportion in the population as a whole. Teachers engage in education—which is a high profile activity in our society.

I theorize that future research into other policy areas with high profile characteristics will similarly prove both the distributional theory and the punctuated equilibrium theory true. I also theorize that my empirical analysis will support my conclusions about the role of teachers unions in the education policy process.
CHAPTER III

THE POLICY PROBLEM: ALTERNATIVE TEACHER CERTIFICATION

Introduction

In this dissertation, I study the passage of alternative teacher certification policies in state legislatures and administrative agencies. My goal is to determine the role that teachers unions play in the education policy process. If I am correct that teachers unions play a large role in the education policy process, I expect to find that states with a large percentage of legislators who list their non-legislative occupation as K-12 education are less likely to pass alternative teacher certification policies than states with a small percentage of legislators who list their non-legislative occupation as K-12 education. I also expect to find that states with a large percentage of teachers who work under union-negotiated contracts are less likely to pass alternative teacher certification policies than states with a small percentage of teachers who work under union-negotiated contracts.

In this chapter I discuss information about the alternative teacher certification policy area. I define alternative teacher certification and describe various alternative teacher certification programs passed pursuant to state alternative teacher certification policies. I note estimates that one-third of all new teachers are currently entering the profession through alternative routes. I describe the benefits and detriments of alternative teacher certification programs. I discuss evolving teachers unions’ reactions to alternative teacher certification programs. Lastly, I note recent federal policy in support of alternative teacher certification programs.
It is my hope that information about the alternative teacher certification policy area will enrich understanding of the empirical research chapters to follow and will fuel further research into the education policy area.

Alternative Teacher Certification: A Primer

What constitutes an alternative teacher certification policy? For purposes of this dissertation, I include within the term *alternative teacher certification policy* any teacher certification policy that promotes programs that allow people to gain teacher certification without attending a traditional four-year university program leading to teacher certification. Zeichner and Schulte (2001) employ the same definition in their meta-analysis of peer-reviewed research about alternative teacher certification programs.

Alternative teacher certification programs vary in numerous dimensions: goals, sponsors, admission criteria, demographics of recruits, duration of training, type of training, mentoring support, and retention rates (Zeichner and Schulte 2001; Feistritzer and Chester 2001; Rose 2002; Blair 2003). Some programs aim primarily to fill vacancies in inner-city and rural areas; other programs aim primarily to fill vacancies in science, math, special education, and other content areas that experience shortages of traditionally certified teachers. Alternative teacher certification program sponsors include states, universities, school districts, regional education agencies, and nonprofit organizations. Some alternative teacher certification training programs begin when new teachers enter the classroom for the first time, other alternative teacher certification training programs end before new teachers enter the classroom for the first time. Some programs include mentoring support during the first year of teaching; other programs do not include mentoring support.
Information about just a few alternative teacher certification programs illustrates the overall diversity of such programs across the nation. The federal Troops to Teachers program trains former military personnel for teaching careers (No Child Left Behind Act 2002, Sections 6671-77). The New York City Teaching Fellows program admits only a fraction of its applicants—2,000 of 15,000 in the 2002-2003 school year—and trains them for only thirty days in the summer before they begin classroom teaching (Rubinstein 2003). By contrast, some university-based alternative teacher certification programs require each participant to earn a master’s degree before teaching in a classroom (Salyer 2003). The New Jersey Provisional Teacher Program allows school districts to employ college graduates in teaching positions and to certify them as teachers after two hundred hours of training in regional training centers during their first year of teaching (Feistritzer and Chester 2001, 406-408). Texas has an extensive array of 34 alternative teacher certification programs ranging from school district programs to statewide programs to programs based inside community colleges (Feistritzer and Chester 2001, 406-408).

Alternative Teacher Certification: A Growing Phenomenon

The National Center for Education Information (NCEI), a private research organization founded in 1980 and based in Washington, D.C., has researched alternative teacher certification programs since 1983. For many years, NCEI has issued reports detailing alternative teacher certification programs available in the states. In its 2001 report, NCEI states that to date approximately 150,000 teachers around the nation have entered the profession via alternative routes (Feistritzer and Chester 2001, 3).

NCEI estimates that currently one-third of new teachers enter the profession through alternative routes. A 2002 article quotes NCEI as follows, “considering that an estimated 75,000
newly minted teachers are now being hired per year, alternative routes could be contributing about one-third of new teachers being hired” (Rose 2002). A 2003 article quotes NCEI’s president, C. Emily Feistritzer, as estimating in more certain terms that alternative teacher certification programs are producing one-third of the country’s new teachers. Feistritzer predicts that the programs will produce an even greater percentage of the nation’s teachers in the future (Blair 2003, 36).

At least two foundations have endorsed the alternative teacher certification trend. In “The Quest for Better Teachers: Grading the States,” the Thomas B. Fordham Foundation wrote that “states should expand the pool of talented teaching candidates by allowing well-educated candidates who have not attended schools of education to teach” (Finn, Kanstoroom, and Petrilli 1999, vi). The foundation noted that there is little solid evidence linking the traditional method of teacher certification with high-quality teaching (Finn, Kanstoroom, and Petrilli 1999, 4). In its report, “Teacher Certification Reconsidered: Stumbling for Quality,” the Abell Foundation similarly reported on the dearth of evidence linking traditional methods of teacher certification to what research has revealed are the attributes of good teachers. The foundation wrote, “reduced to its essence, teacher certification is incapable of providing any insight into an individual’s ability, intellectual curiosity, creativity, affinity for children, and instructional skills” (Abell Foundation 2001, 41). I will discuss the Abell Foundation report, and criticism of the report, in later sections of this chapter.

Alternative Teacher Certification: Perceived Benefits and Detriments

In Meeting the Highly Qualified Teacher Challenge: The Secretary’s Annual Report on Teacher Quality, the U.S. Department of Education notes that the pool of teachers from alternative certification programs includes greater numbers of minority teachers, long-term
teachers, and high quality teachers than the pool of teachers from traditional certification programs. In Texas, where 91% of teachers are white, 41% of teachers entering the profession through alternative certification programs are from minority groups. Nationwide, 85% of alternatively certified teachers remain in the classroom five years after beginning their teaching careers. Although only 14% of traditionally trained teachers have college entrance test scores in the top quartile, up to 33% of alternatively certified teachers have top quartile scores. Alternatively certified teachers are more likely than traditionally certified teachers to accept jobs in hard-to-fill subject areas and hard-to-fill geographic locations (U.S. Department of Education, 2002).

Studies of alternative teacher certification programs have criticized particular aspects of some programs, but offered few criticisms of alternative teacher certification programs in general. Zeichner and Schulte (2001) analyze peer-reviewed research about alternative teacher certification programs and conclude that the data on teacher retention and teacher performance is mixed. They note that fundamental flaws exist in alternative teacher certification research. Those flaws stem from the diversity of alternative teacher certification programs, the lack of detailed descriptions of those programs, and the difficulty of teasing out which outcomes result from the characteristics of the participants who enter each alternative teacher certification program and which outcomes result from other aspects of the program. Zeichner and Schulte advocate that future research not evaluate traditional programs against alternative programs, but rather evaluate the components of the programs.

Most states have embraced the benefits of alternative teacher education programs. In a June 11, 2003, letter to the members of the New York Board of Regents, the New York State Education Department notes, “the most significant benefit of offering alternative teacher
certification programs has been an increase in the number of qualified people entering teaching, generally in hard-to-staff schools.” Other states, including California, Texas, New Jersey, Georgia, Alabama, and Florida, similarly welcome alternative teacher certification programs and certify large numbers of teachers through those programs (Feistritzer and Chester 2001, 14).

Only five states have not adopted alternative teacher certification programs (Brewer 2003, 4). Some states have enacted only token programs (Feistritzer and Chester 2001). One state, Maryland, has adopted programs but hindered their implementation (Abell Foundation 2001).

According to the Abell Foundation report, Maryland has stymied its alternative teacher certification programs. The report notes that “neither the ten-year-old alternative teaching certificate, known as the Resident Teacher Certificate, nor the State’s Credit Count procedure offer prospective teachers significant ways to circumvent the State’s cumbersome regulatory hurdles” (Abell Foundation 2001, 35). The report further notes that Maryland gradually raised the credit requirements for the Resident Teacher Certificate to within nine credits of what the state requires under the traditional certification method (Abell Foundation 2001, 37). The report reveals that the successful national program Teach for America has identified Maryland’s teacher regulations as “the most stringent” of all the regulations that Teach for America encounters around the nation.

The Abell Foundation Report

The purpose of the non-profit Abell Foundation is to enhance the quality of life in Baltimore and Maryland. For that reason, the foundation’s 2001 report used teacher certification examples from Maryland. Despite the report’s Maryland bent, supporters and critics alike regard the report’s teacher certification and teacher quality findings as applicable all over the nation.
The Abell report focuses primarily on problems with traditional teacher certification programs and the lack of rigorous research-based evidence supporting those programs. The report states bluntly, “the claim [by the traditional teacher certification establishment] that there is a body of research proving the value of teacher certification, estimated to consist of 100-200 studies, is specious.” The report found deficiencies in those 100-200 studies including: (1) lack of peer review; (2) multiple references that only appear to provide support; (3) irresponsible citing of older, less reliable research; (4) lack of standardized assessment measures of student achievement; and (5) violation of basic statistical analysis principles (Abell Foundation 2001).

The Abell report is not alone in its criticism of teacher certification research. Michigan State University College of Education professors Suzanne M. Wilson, Robert E. Floden, and Joan Ferrini-Mundy raise similar objections to teacher preparation research in a research review requested by the Office of Educational Research and Improvement of the U.S. Department of Education (Wilson, Floden, and Ferrini-Mundy 2002). They urge education experts to engage in teacher preparation research: (1) that is peer reviewed; (2) that speaks to audiences beyond the field of teacher education; (3) that includes sufficient descriptions of research methods to enable others to judge the validity of the conclusions; (4) that includes only carefully selected citations; (5) that includes good impact measures; and (6) that includes large-scale quantitative analyses.

When addressing the question of teacher quality, the Abell report notes that rigorous research conducted by economists and social scientists reveals that effective teachers score high on verbal ability tests and have good content knowledge. The Abell report also notes that master’s degrees in education do not improve teacher quality, but master’s degrees in content areas do improve teacher quality. Some of the studies cited with approval in the Abell report

Judging by the number of references and responses to the Abell report in current education literature, the report has had a large impact on teacher certification policy in the nation. Not all responses to the Abell report have been positive. The Abell report’s most prolific critic from among education experts appears to be Linda Darling-Hammond, who has written extensively on teacher certification and teacher preparation topics, including alternative teacher certification (Darling-Hammond 2000; Darling-Hammond, Berry, and Thoreson 2001; Darling-Hammond, Chung, and Frelow 2002; Darling-Hammond and Youngs 2002). Federal government officials appear to have embraced the Abell report. According to Brewer (2003), Congress and the U.S. Department of Education relied on the Abell report when passing the No Child Left Behind Act (NCLB) and related alternative teacher certification policy measures.

Federal Endorsements of Alternative Teacher Certification

The federal No Child Left Behind Act forces states to focus anew on teacher certification issues. According to NCLB, each state has until 2005-2006 to ensure that all teachers in the state are “highly qualified.” The federal government gives some guidance on how states should decide whether a teacher is highly qualified, but leaves the bulk of that decision-making to the states (No Child Left Behind Act 2002).

In the process of giving guidance to the states about what constitutes a “highly qualified” teacher under NCLB, the federal government has endorsed the use of alternative certification methods. In Meeting the Highly Qualified Teacher Challenge: The Secretary’s Annual Report on Teacher Quality, the U.S. Department of Education commented in a positive fashion about
alternative teacher certification methods and commented in a negative fashion about traditional teacher certification methods:

An interesting innovation has developed in recent years that points the way toward a more promising system of teacher preparation and certification. Alternative routes to certification, as opposed to the traditional routes offered by colleges of education, streamline the process of certification to move qualified applicants into the classroom on a fast-track basis.

* * *

The lesson for policymakers and the public is that traditional teacher-training programs do not necessarily produce graduates with superior teaching skills, while at the same time they impose significant costs and challenges on prospective teachers, especially the most talented candidates.

(U.S. Department of Education, 2002)

NCLB establishes and funds programs to support alternative teacher certification programs. Section 6613(c) of NCLB allows states to apply for federal grant monies for alternative teacher certification purposes including:

(c) Carrying out programs that establish, expand, or improve alternative routes for State certification of teachers and principals, especially in the areas of mathematics and science, for highly qualified individuals with a baccalaureate or master's degree, including mid-career professionals from other occupations, paraprofessionals, former military personnel, and recent college or university graduates with records of academic distinction who demonstrate the potential to become highly effective teachers or principals.

Sections 6681-6684 of NCLB establish and fund the Transitions to Teaching Program. Section 6681 lists the purposes of the program as follows:

(1) to establish a program to recruit and retain highly qualified mid-career professionals (including highly qualified paraprofessionals), and recent graduates of an institution of higher education, as teachers in high-need schools, including recruiting teachers through alternative routes to certification; and

(2) to encourage the development and expansion of alternative routes to certification under State-approved programs that enable individuals to be eligible for teacher certification within a reduced period of time, relying on the experience, expertise, and academic qualifications of an individual, or other factors in lieu of traditional course work in the field of education.
Sections 6671-6677 of NCLB continue support for the federal Troops-to-Teachers program, which is an alternative teacher certification program for former military personnel. NCLB quintupled funding for the Troops-to-Teachers program, up to $18 million (Rose 2002, 18).

Brewer (2003) contends that Congress and the U.S. Department of Education, when crafting NCLB and related policy, relied heavily on the Abell report and its criticisms of traditional teacher certification programs. Brewer himself advocates a neutral position between what he describes as two opposing camps: the NCLB/Abell camp and the traditional education establishment camp. I question whether Brewer is truly neutral. Although he refers to the NCLB/Abell approach to teacher certification as “a radical surgery approach,” he does not criticize the Abell report’s methodology and underlying research. Thus, it appears that Brewer’s disagreement lies not with the NCLB/Abell camp’s arguments, but rather with the speed with which the NCLB/Abell camp is winning teacher certification policy battles against the traditional education establishment.

Teachers Unions’ Reactions to Alternative Teacher Certification

Who do Brewer (2003) and the Abell report authors think comprise “the traditional education establishment?” Brewer writes that those opposing the NCLB/Abell camp are part of the national agenda advocating “the professionalizing of teaching and teacher education, with links to the K-12 standards movement.” Because teachers unions advocate professionalizing teaching and teacher education, Brewer apparently includes teachers unions as part of the traditional education establishment.

The Abell report leaves no doubt that it considers teachers unions to be a part of the traditional education establishment. In a section of the Abell report titled “Maryland’s Allegiance to Professional Teacher Organizations,” the Abell report states, “a major impediment to
substantial deregulation of teacher certification policies in Maryland is the State’s close alliance with powerful organizations whose interests align with maintaining or even strengthening the current regulations.”

Other researchers similarly note that teachers unions oppose alternative certification programs. Zeichner and Schulte (2001), citing Hawley (1990) and Zumwalt (1991), report that teachers unions view alternative teacher certification programs as “undermining attempts to professionalize teaching because they minimize the need for specialized professional knowledge and imply that all a teacher needs is content knowledge and an apprenticeship.”

In recent years teachers unions have given only conditional support to alternative teacher certification programs. Teachers unions have limited their recent support to those alternative teacher certification programs that approximate traditional teacher certification programs in rigor and quality.

The American Federation of Teachers (AFT) Resolution on Teacher Education and Teacher Quality typifies the conditional nature of teachers union support for alternative teacher certification programs (American Federation of Teachers 2000). The resolution calls for “alternative routes to teaching that, at a minimum, require all students to pass state teacher testing exams in the appropriate content areas and that offer pedagogical coursework, monitor alternative-candidate performance in the classroom, and provide necessary services to support the development of effective teaching skills and strategies” (American Federation of Teachers 2000). Sandra Feldman, ATF president, says she “fully supports good alternative certification programs” but cautions against programs that allow “any warm body to teach” (Feldman 1998). Feldman embraces alternative teacher certification programs that include mentoring components, peer assistance, peer review, and examinations (Feldman 2002). Although she says that teachers
should be able to earn certification “without jumping through bureaucratic hoops,” she also says that alternative certification programs “should never become a route around standards and quality.” Feldman’s statement about coursework differences between traditional and alternative teacher certification routes reveals that perhaps she believes traditional and alternative routes should be identical. She states, “if there are teacher education courses that are weak or irrelevant or useless, no one coming into the profession should have to take them” (Feldman 2002).

The National Education Association (NEA) currently takes a similar conditional approach to alternative teacher certification programs. The NEA approves of master’s degree programs, which the NEA says, “offer a good mix of field experience and theory.” The NEA, however, disapproves of alternative teacher certification programs, which “emphasize on-the-job training.” The NEA raises professionalism as part of its objection to alternative certification programs. June VanderVeen of NEA's Teacher Quality Department is concerned that students seeking traditional teacher certification might wonder why they have to sit through four years of classes. She argues, "we want teaching to be a profession." She argues that other professions don't have alternative routes (Hess 2004).

At least one education expert has directly addressed the professionalism argument raised by teachers unions. Frederick M. Hess, a University of Virginia professor who serves both in the Curry School of Education and in the School of Government and Foreign Affairs College of Education, wrote a Progressive Policy Institute report advocating a radical overhaul of traditional teacher certification methods (Hess 2001). In the report, Hess notes the basic assumption behind professionalism—the assumption that licensing processes elevate professions “by requiring mastery of well-documented and broadly accepted knowledge and skill.” Then Hess argues, “unlike cases of law or medicine, where the existence of an accepted canon makes licensure a
useful device for ensuring minimal competence and consequently boosting public confidence in members of the profession, educational licensure as currently practiced imposes significant costs without yielding commensurate benefits.” In his conclusion, Hess compares traditional methods of teacher certification with alternative methods of teacher certification. He concludes that alternative methods, which treat teachers as autonomous professionals able to guide their own training, will result in more professionalism for teachers than traditional methods, which operate like monopolies and lack incentives to improve quality.

Conclusion

Teachers unions, foundations, researchers, school districts, state departments of education, and university colleges of education all play a role in the alternative teacher certification policy area. The NCEI estimated in 2003 that one-third of new teachers are entering the profession via alternative routes. The policy area will likely increase in prominence due to the federal government’s “highly qualified teacher” policy directive to the states, together with NCLB’s provision of almost $3 billion in flexible grants to states and school districts to improve teacher quality. These factors raise the practical importance of research into the policy processes surrounding alternative teacher certification programs, including research into the role of teachers unions in those policy processes.

Although in this chapter I have reported on what the teachers unions, foundations, government officials, and many researchers think about the benefits and detriments of alternative teacher certification policies and programs, once again I note that this dissertation is not concerned with whether alternative methods of teacher certification are better or worse than traditional methods of teacher certification. This dissertation does not involve any examination of whether alternative teacher certification policies or programs are good or bad. Likewise, this
dissertation does not involve any examination of the merits or detriments of traditional methods of teacher certification. I confine my research to political questions about the passage and strength of alternative teacher certification policies in the states. I leave normative concerns to future researchers.
CHAPTER IV

METHODS

Introduction

In this chapter, I describe the methods and data I use to test my theory that teachers unions influence education policy. As I discuss in my theory and literature review chapter, the two political science theories that blend best with my theory of teachers union strength are Baumgartner and Jones’s (1993) punctuated equilibrium theory of the policy process and Weingast and Marshall’s (1988) distributional theory of legislative committee composition. The former theory involves processes mostly external to the legislature and the latter theory involves processes internal to the legislature.

In order to test both teachers unions political strength external to state legislatures and teachers unions political strength internal to state legislatures, I use two variables to measure political strength. One variable measures the percentage of teachers in a state who work under union-negotiated contracts. The other variable measures the percentage of legislators in a state who list their non-legislative occupation as K-12 education.

I predict that my examination of alternative teacher certification policy processes in the states will demonstrate that not only do teachers unions exert influence on policy by acting outside the legislature; they also exert influence by acting inside the legislature. Thus, I expect to find not only that teachers unions exert influence, but also that they exert influence in a manner that Baumgartner and Jones might expect and in a manner that Weingast and Marshall might expect.
I use two main methods: a probit event history analysis and an ordinary least squares regression analysis. The event history analysis is necessary because I am testing the passage of alternative teacher certification policies over time. Due to fact that event history analysis does not allow researchers to account for variation among events, I supplement the event history analysis with a regression analysis of the strength of alternative teacher certification policies passed by the states. The two methods inform me about the influence of teachers unions on both the passage and strength of alternative teacher certification policies in the fifty states.

My dependent variable for the event history analysis consists of a dummy variable indicating whether or not a state has passed an alternative teacher certification policy in a given year. My dependent variable for the regression analysis consists of a measure of the strength of the alternative certification policy. My control variables include measures of political, economic, and educational factors particular to each state and various diffusion measures including the number and proportion of adjoining states and regional states that have already adopted alternative certification policies. My unit of observation for the event history analysis is the state-year. My unit of observation for the policy strength regression analysis is the state, with all independent variables set at their values in 1989 because by the end of that year half of the states had adopted alternative teacher certification policies.

I begin this chapter by listing four main hypotheses that flow from my theory. I also list two bureaucratic control hypotheses that flow from my results and help inform my theory. After listing the hypotheses, I briefly describe the two main models I use to test those hypotheses. In the main sections of this chapter, I explain the event history analysis method I employ, I explain why I supplement the event history analysis with a regression analysis of the strength of the
alternative teacher certification policies passed by the states, and I explain why I include the two bureaucratic control hypotheses.

Hypotheses

Hypothesis One: Alternative teacher certification policies diffused first into states with low levels of teachers union political strength as measured by small percentages of legislators who list their non-legislative occupation as K-12 education and later into states with high levels of teachers union strength as measured by large percentages of legislators who list their non-legislative occupation as K-12 education.

Hypothesis Two: Alternative teacher certification policies diffused first into states with low levels of teachers union political strength as measured by small percentages of teachers who work under union-negotiated contracts, and later into states with high levels of teachers union strength as measured by large percentages of teachers who work under union-negotiated contracts.

Hypothesis Three: States with high levels of teachers union strength as measured by large percentages of legislators who list their non-legislative occupation as K-12 education are more likely than other states to pass strong alternative certification policies and conversely states with low levels of teachers union strength as measured by small percentages of legislators who list their non-legislative occupation as K-12 education are more likely than other states to pass weak alternative certification policies.

Hypothesis Four: States with high levels of teachers union strength as measured by large percentages of teachers who work under union-negotiated contracts are more likely than other states to pass strong alternative certification policies, and conversely states with low levels of teachers union strength as measured by small percentages of teachers who work under union-
negotiated contracts are more likely than other states to pass weak alternative certification policies.

Hypothesis Five: State legislatures exercise control over education administrative agencies and thus prevent those agencies from passing weak alternative teacher certification policies that represent a large departure from traditional methods of teacher certification.

Hypothesis Six: In the alternative, state legislatures exercise control over education administrative agencies and thus prevent those agencies from passing alternative teacher certification policies except weak policies that serve primarily as stop-gap measures.

The Two Main Models

I use two main models: a probit event history analysis diffusion model and an ordinary least squares regression policy strength model. Results from the two models appear in Table 3 and Table 4, respectively.

The Probit Event History Analysis Policy Diffusion Model

\[ P(Y=1|X) = \phi(\sum b_kX_k) \]

The \( Y \) is a dummy variable indicating whether or not a state passed its first substantial alternative teacher certification policy in a given year. The \( X \) represents the following eight independent variables:

- time counter
- percentage of teachers who work under union-negotiated contracts
- percentage of legislators who list their non-legislative occupation as K-12 education
- teacher shortage percentage
- per pupil spending
- legislative professionalism
- divided government (dummy)
- democratic governor (dummy)
In the probit equation, $\phi$ equals the probit function, $b$ equals the coefficients on the independent variables, and $k$ equals the number of independent variables.

I run various permutations of the main event history model in order to determine which time periods to use, whether there is a difference between the passage of strong and the passage of weak policies, whether there is a difference between policies passed by state legislatures and policies passed by state administrative agencies, and what types of diffusion mechanisms might influence states to adopt alternative teacher certification policies passed by other states.

**The Ordinary Least Squares Regression Policy Strength Model**

\[ Y = \Sigma(bX_k) + \varepsilon \]

The $Y$ is a measure of the strength of each state’s first substantial alternative teacher certification policy. The $X$ represents the following seven independent variables:

- percentage of teachers who work under union-negotiated contracts
- percentage of legislators who list their non-legislative occupation as K-12 education
- teacher shortage percentage
- per pupil spending
- legislative professionalism
- divided government (dummy)
- legislative or administrative policy (dummy)

I run various permutations of the main policy strength model in order to determine which time periods to use, whether there is a difference between the passage of strong and the passage of weak policies, whether there is a difference between policies passed by state legislatures and policies passed by state administrative agencies.

**Event History Analysis**

I employ event history analysis covering the period from 1975 to 2000 to determine whether and in what respects teachers unions influenced the passage of alternative teacher
certification policies in the states. In this section, I explain why and how I use event history analysis. I describe the evolution, the benefits, and the detriments of event history analysis.

*The Basics of Event History Analysis*

Tucker (1982) notes that when we study events that occur over time, the correlations of those events and the independent variables that lead to those events are not consistent over time. This is true because some independent variables remain consistent over time but other independent variables change with time. Because correlations are the basis of regression analysis, we cannot rely on regression analysis to help us understand events that change over time.

Paul D. Allison’s monograph *Event History Analysis: Regression for Longitudinal Event Data* introduces political scientists to event history analysis as a method that overcomes problems that occur when independent variables vary over time. Without event history analysis, researchers studying event histories lose information and consequently experience severe bias in their results (Allison 1984). To make full use of available data, researchers must examine not only factors present at the time the events in question happen, but must also examine factors present during those times when no events happen. Rather than keeping variables static through time, event history analysis researchers allow time-varying variables to vary through time. Rather than using entities as the units of observation, event history analysis researchers use each entity in each time increment as the units of observations.

Each event history analysis involves two dependent variables—the actual dependent variable used in the equation and the estimated dependent variable calculated by the statistics computer program (Allison 1984; Berry and Berry 1990). The actual dependent variable is a dummy variable coded 0 for a particular entity in a particular time increment if that particular
entity did not experience an event during that time increment, and coded 1 if the entity experienced the event during that time increment. The statistics computer program calculates the estimated dependent variable, which is the probability that an entity will experience an event during a particular time increment.

Researchers refer to the estimated dependent variable as the “hazard rate.” The hazard rate can be calculated by totaling the number of entities that had not yet experienced the event by the beginning of a particular time increment (the number of entities “at risk” of experiencing the event during that time increment), and dividing that risk set number by the number of entities that experience the event during that time increment. The hazard rate represents the probability that an entity in question will experience an event during a particular time increment.

Measuring Time Variation

There are three methods for determining whether the hazard rate varies with time. The first method involves creating a series of dummy variables, one for each time increment except one of the time period of the analysis (Allison 1984; Berry and Berry 1990; Mintrom 1997; Box-Steffensmeier and Jones 1997; Rosenson 2003). Allison recommends researchers run two models, one with the series of dummy variables and one without, and then compare the two models to test the null hypothesis that the hazard rate does not vary with time. To compare the two models, researchers calculate a test statistic consisting of twice the absolute difference of the log likelihoods of the two models and then consult a chi square table to check the probability level using twice the difference of the log likelihoods and degrees of freedom equal to the number of time dummy variables in one model but not in the other model (Allison 1984, 20).

A second method for determining whether a hazard rate varies with time involves calculating a mathematical function called a “natural cubic spline” in order to smooth out the
time variable. Beck, Katz, and Tucker (1998) describe the cubic spline method and indicate that they “have a slight preference” for using the cubic spline method over the dummy method (Beck, Katz, and Tucker 1998, 1271). The term “spline” refers to a thin flexible rod that draftsmen used in the past to draw smooth curves. Rather than forcing a thin flexible rod to pass through a point for every time increment on our time graph, we force our flexible rod to pass only through certain points which we call knots. Our cubic spline calculations predict what shape our imaginary thin flexible rod will take when it passes through certain knots that we specify in advance. The use of natural cubic splines instead of time increment dummies smoothes the time variable. The use of natural cubic splines also saves degrees of freedom; instead of using a degree of freedom for each time increment dummy, we use a degree of freedom for each knot we specify in our natural cubic spline calculations. A cubic spline is termed “natural” when we hold our imaginary thin flexible rod fixed not only at the interior knots, but also at the endpoints.

The third method for determining whether a hazard rate varies with time involves using a time counter independent variable and testing whether that variable is significant. Time counters can be straight time increments from the beginning of the time period in question or can be the number of time increments from the peak time increment of the event in question. The time counter method appears reasonable where the time period involved is long and thus the calculation of year dummies would be cumbersome and the use of year dummies would consume many degrees of freedom.

I note that Allison (1984) used a five-year example in his book. Berry and Berry (1990) used a 12-year time period in their research. Mintrom (1997) used a seven year time period in his research. By contrast, my research involves a 26-year time period. For that reason I believe using
a time counter is a reasonable alternative in my research to control for time varying effects not otherwise specified in the model.

The Events: Passages of Alternative Teacher Certification Policies

I recognize that some states have passed more than one alternative teacher certification policy. The Kentucky legislature, for example, passed alternative teacher certification policies in 1984, 1990, 1996, 1998, and 2000. Allison (1984) notes that researchers may properly consider repeatable events to be non-repeatable if the researchers have a theoretical reason to suspect that the process generating the first event differs from the process generating the latter events. With regard to alternative certification policies, I believe that the process generating the first such policy in a state differs from the process generating later such policies. I base my belief on theory underlying the political strength of teacher unions in the education policy arena. In my view, passage of the first alternative certification measure in a state overcomes political objections from teachers unions, which are filled with teachers who earned their certificates via traditional routes. Once the first policy is passed, I presume that teachers union membership will grow to include those certified via non-traditional routes. I also presume that after the first alternative certification policy is passed, teachers unions can no longer object to subsequent measures by arguing against unknown facts. For these reasons, I choose to study only the passage of the first substantive alternative teacher certification measure passed in each state.

I consider an alternative teacher certification policy as substantive if it is more than just a method to garner a traditionally certified teacher an additional certificate, and if it is more than just a method to allow a soon-to-be traditionally certified teacher to enter the classroom during his or her last few courses. I consider a measure as substantive if it represents a substantial
departure from traditional teacher certification methods. Table 6 includes a list of the alternative teacher certification policies I use in my analysis and discuss in this dissertation.

Although the alternative teacher certification policies I use in my event history analysis are all substantive, they differ in how far they depart from traditional methods of teacher certification. Strong policies resemble traditional methods; weak policies resemble stop-gap measures.

Allison (1984) and Berry and Berry (1999) caution that failure to distinguish between different types of events may lead to misleading results. Allison recommends doing a separate event history analysis model for each type of event (Allison 1984, 48). Berry and Berry note that researchers should distinguish between what Glick and Hays (1991, 836) term “deep” and “superficial” adoptions of policies (Berry and Berry 1999, 189).

I follow the advice of Allison (1984), Glick and Hays (1991) and Berry and Berry (1999). I run separate event history analysis models for those states that passed strong alternative teacher certification policies and those states that passed weak alternative certification policies. I also run separate event history analysis models for those states in which the alternative certification policies were passed by state legislatures and those states in which the alternative certification policies were passed by administrative agencies. I run difference of means tests on the two sets of models. I also run a model with a dummy variable coded 0 if the state’s first substantive alternative teacher certification policy is weak and coded 1 if the state’s first substantive alternative teacher certification policy is strong. In the data chapter, I describe the sources I used to calculate whether a state’s first alternative teacher certification policy is weak or strong.
Units of Observation, Left-Censoring, and Right-Censoring

My unit of observation is the state-year. I observe state-years from 1975 to 2000. I consider each state during the years when that state was “at risk” for the event in question, to wit: passage of its first substantive alternative teacher certification policy. Thus, I consider each state-year that is either the exact year that the state passed its first substantive alternative teacher certification policy or any year prior to when the state passed its first substantive alternative teacher certification policy. I do not consider any state-years for a particular state after the year that it passed its first substantive alternative teacher certification policy.

One problem arises because New York is “left-censored”—meaning New York enacted its first substantive alternative teacher certification measure before the 1975-2000 time period of this study. Although I could consider the New York policy as if it was passed during the first year of this study, Allison (1984) notes that such a consideration will introduce bias into my results if time dependence is present in my model. Because I have found that time dependence is present in my model, I follow Allison’s advice to simply discard the left-censored state. For this reason, I do not consider any state-years for New York in my study.

Another problem arises because by the end of 2000, six states had not yet passed substantive alternative teacher certification policies. Those “right-censored” states include Indiana, Iowa, Maine, Nebraska, North Dakota, and Rhode Island. Allison (1984) recommends running separate models to estimate the effect of treating right-censored data in different ways. I ran three separate models: one model omitting the six right-censored states, a second model treating the right-censored states as if they did not pass any substantive alternative teacher certification policies during the 1975-2000 period of this study, and a third model treating the
right-censored states as if they passed a substantive alternative teacher certification policy during the last year of the study.

All three models have statistically significant chi square statistics. Although the first and third models have higher pseudo $R^2$ (.2084 and .1797 respectively) than the second model (pseudo $R^2$ .1443), I choose to use the second model for several reasons. First, the model represents what actually happened; none of those six states passed substantive alternative teacher certification policies during the 1975-2000 time period in question. Second, none of the independent variables in the first model are statistically significant. Third, the statistical significances of the independent variables in the second and third models are similar. Fourth, I find it best to error on the conservative side rather than pretend that all six states passed substantive alternative teacher certification policies during the last year of the study. Fifth, only one of the six states, Rhode Island, has passed a substantive alternative teacher certification policy in the years after 2000.

*Measuring Diffusion of the Policy Innovation*

Political scientists use event history analysis not only to study the internal political, economic, and social factors that contribute to the passage of particular policies in particular jurisdictions, but also to study the extent to which policies diffuse from one jurisdiction to another. Berry and Berry (1992) distinguish between internal political, economic, and social factors and external diffusion factors. They urge researchers to include both internal and external factors in their policy models. If we fail to control for internal factors, what appear to be regional effects might just be similarities between states in a particular region.

Berry and Berry (1990, 1992) theorize that policy diffusion occurs because (1) the first states to pass a given policy act as laboratories, thus enabling other states to see, without any cost
to themselves, whether the policy will work, (2) the first states to pass a policy share information
with other states about the efficacy of the policy and thus simplify the decision-making of later-
passing states, (3) voters who see new policies working in other states are pleased when their
own legislators pass the same or similar policies, and (4) after a critical number of states have
passed a certain policy, voters and legislators in remaining states might pass the policy because
they might perceive that failure to pass the policy might be unfair in an economic or social sense.
Berry and Berry (1999) theorize that the mechanisms of diffusion include news stories about
policies in other states, public pressures to pass policies existing in other states, and information
sharing at professional conferences and through professional associations involving people from
different states.

Simmons and Elkins (2004) discuss the mechanics of economic innovation diffusion on a
global level as follows: “We think of diffusion as resulting from one of two broad sets of forces:
one in which mounting adoptions of a policy alter the benefits of adopting for others and another
in which adoptions provide policy-relevant information about the benefits of adopting.”
Simmons and Elkins describe the first set of forces as changing payoff structures and the second
set of forces as new sources of salient policy information (Simmon and Elkins 2004, 178). They
use separate variables to measure payoff structure changes and sources of salient policy
information.

Although I find Simmons and Elkins’s diffusion mechanism distinction relevant in their
study of global economic innovation, I believe that additional alternative teacher certification
policy adoptions do not significantly alter the benefits of adopting for other states. The benefits
of adopting alternative teacher certification policies remain the same regardless of how many
states have adopted such policies.
Mintrom (1997) theorizes that diffusion can occur due to the fact that other states have adopted the same or similar policies, or can occur due not to any diffusion mechanism but rather due simply to the maturational effect of time. Mintrom writes that if other states have already passed the same or similar policies, state policymakers may view the policy as one whose “time has come” (Mintrom 1997, 754). Buckey (2002) and Mooney (2001) similarly distinguish between what they consider diffusion mechanisms and what they consider the mere passage of time.

I question the wisdom of making such a distinction between diffusion mechanisms and mere maturational effects. In my view, it is a distinction without a difference. The passage of time causes the diffusion factors to happen. I tend to agree with Box-Steffensmeier and Jones (1997) where they cite Nathaniel Beck for the proposition that “time-dependency or duration-dependency frequently indicates an inadequately specified model” (Box-Steffensmeier and Jones 1997, 1444). If we could specify all the mechanism of diffusion—meaning all the things that happen over the course of time to cause legislators in new states to pass policies already passed in other states—the time-dependency of our model would disappear and be replaced by those mechanisms. In other words, we use time as a proxy for time-operating variables we cannot name and measure.

I use time as a proxy for time-operating variables I cannot name or measure. I try seven different independent variables in my event history analysis model in an attempt to capture external diffusion factors that operate through time. One of the independent variables I use is a simple time counter. The other six independent variables I use are based on either the numbers or proportions of a particular state’s adjacent neighbors, regional neighbors, or national neighbors who have previously passed a substantive alternative teacher certification policy.
Data Collection Interpolation and Extrapolation

The diffusion independent variables I mention in the previous section are easy to calculate. I simply count the number and proportion of adjoining or regional states that previously passed an alternative teacher certification policy prior to the state-year in question. Finding precise values for each of 1,300 state-years for each of the other independent variables in my dataset was not easy.

Researchers typically encounter problems finding sufficient data for all years of all time-varying independent variables in event history analysis studies. Allison (1984) recommends that when data is not available for certain years, researchers should use ad hoc procedures for estimating the data. One ad hoc approach is to enter the value available for the variable for the time closest to the time in question. A better procedure is to employ linear extrapolation and interpolation. I discuss my data estimation methods in my data chapter.

Event History Analysis: Using Probit or Logit or Clog-Log

Because event history analysis involves a dichotomous dependent variable, event history analysis requires the use of a dichotomous variable estimation technique such as logit, probit, or complementary log-log link (clog-log). Probit, logit, and clog-log, all of which use the maximum likelihood estimation technique, allow us to bypass the ordinary least squares regression assumptions of autocorrelation, heteroskedasticity, and nonlinearity (King 1998, 71).

When the probability of an event is less than 25%, logit and clog-clog results are almost identical (Beck, Katz, and Tucker 1998, 1268). Beck, Katz, and Tucker thus recommend using the more familiar logit in lieu of clog-log. The choice of whether to use probit or logit sometimes depends upon the distribution of the error term—probit distributions have smaller tails than logit distributions (Aldrich and Nelson 1984). When a dataset has few observations at extreme
probability values, the logit and probit results will be essentially identical (Aldrich and Nelson 1984). When probit and logit results are essentially equal, the choice of probit or logit often depends upon the fact that probit is easier to use than logit.

In order to decide whether to use probit or logit, I first noticed that my dataset includes few observations at extreme probability values. Next, I ran preliminary models using probit and logit. I also ran a preliminary model using clog-log. I find little difference between the models. For that reason, and for the reason that probit is generally easier to use than logit, I use probit for my event history analyses.

**Supplementations of the Event History Analysis Technique**

I supplement my event history analysis in two respects that I have not observed in the literature on event history analysis. I embark on these two novel statistical paths because I take seriously Gary King’s plea that political scientists must be creative—we must be statistical tool makers as well as statistical tool users (King 1998, 252).

*Using Policy Strength as a Dependent Variable*

In my first supplementation of the event history analysis technique, I rate the strength of the various alternative teacher certification policies passed by the states and then use those strength ratings as a dependent variable in an ordinary least squares regression. Thus, rather than treating all alternative teacher certification policy passage events as equal, I supplement my event history analysis with an ordinary least squares regression analysis of the strength of the various alternative teacher certification policies passed by the states.

This first supplementation is similar to the event history analysis models I run separately for those states which passed strong alternative teacher certification policies and for those states which passed weak alternative teacher certification policies. Here, however, instead of running
separate event history analysis models, I run an ordinary least squares regression analysis with the strength of the policy as the dependent variable. In this regression, I use states as units of observations, and I set all the independent variables to their 1989 values because 1989 was the peak year of alternative teacher certification policy adoptions—by the end of 1989 half of the states had passed alternative teacher certification policies. I compare my results from the two techniques. I hope both techniques provide me with information about which variables lead states to pass strong or weak alternative teacher certification policies.

Using A Large Matrix of Statistical Results to Analyze Time Periods

In my second supplementation of the event history analysis technique, I run 96 extra models in order to analyze the effects of choosing different time periods for my event history analyses. I run the 96 separate event history probit analyses for all combinations of time periods with beginning dates of 1975 to 1982 and ending dates from 1990 to 2001.

After running the 96 analyses, I chart the results in a matrix. The matrix allows me to observe the effects of choosing different time periods for the event history analysis. The matrix is set forth in Table 5. I discuss the matrix in the results chapter.

Examining Legislative v. Bureaucratic Policy Differences

I employ several techniques in an attempt to test the bureaucratic control hypotheses. First, I include a dummy variable in the policy strength model in an attempt to determine whether there is any significant difference between the passage of alternative teacher certification policies by state legislatures and the passage of such policies by state administrative agencies.

Second, I run separate event history analysis models—one with state-year observations from those states that passed strong alternative teacher certification policies and another with
state-year observations for those states that passed weak alternative teacher certification policies. Third, I run two difference of means tests. In the first difference of means test, I compare the difference of means of the policy strength variable in two datasets—one consisting of state-year observations from states where the state legislature passed the first substantial alternative teacher certification policy and the other consisting of state-year observations from states where a state administrative agency passed the first substantial alternative teacher certification policy.

In the second difference of means test, I do the reverse. I compare the difference of “means” of the dummy variable that indicates whether state’s alternative teacher certification policy was passed by the state legislature or by a state administrative agency in two datasets—one consisting of state-year observations from states with strong policies and the other consisting of state-year observations from states with weak policies.

Third, I examine a series of four event history analysis models run with different segments of the dataset. I run separate models for strong and weak policies. I also run separate models for policies passed by the legislature and for policies passed by state administrative agencies. I compare the results from those models.

Conclusion

In this chapter I describe the two main models I use to test my theory that teachers unions have political power. One model is an event history model and the other is a policy strength model. I set forth a series of six hypotheses—two to test the event history model for evidence of teacher union political control over the passage of alternative teacher certification policies, two to test the policy strength model for evidence of teacher union political control over the strength of alternative teacher certification policies, and two to test my presumption that I can treat legislative and administrative passage of alternative teacher certification policies as if the
legislature exercises control over the administrative agencies. In the next chapter I describe the
data I use to test the hypotheses.
CHAPTER V

DATA

Introduction

In this chapter, I discuss my data and the sources of my data. I begin by discussing the nature and sources of the dependent variables in the event history analysis policy diffusion models and in the ordinary least squares regression policy strength models. Next, I discuss the nature and sources of the independent variables. In the last section of this chapter, I describe the data preparation and diagnostic procedures I use to test for outliers, normality, heteroskedasticity, multicollinearity, linearity, and model specification errors.

Dependent Variables

I use one dependent variable for the event history models and another dependent variable for the policy strength models. In the following sections I describe how I calculate the dependent variables.

*The Event History Analysis Model Dependent Variable*

The timing of events is technically not a variable in an event history analysis model, but information about the timing of events is critical to an event history analysis. Event history analysis, by definition, is an analysis of the history of events. Information of the timing of events enters the event history model in two respects. First, researchers construct the event history analysis dependent variable from information about the timing of the events. Second, researchers select the observations to use in the model based upon information about the timing of the events.
The events of interest in this dissertation are each state’s first enactment of a substantive alternative teacher certification policy. I use the years of enactment to construct the dependent variable for the event history analysis model. I code the dependent variable as one for each state-year in which the state enacted its first substantive alternative teacher certification policy. I code the dependent variable as zero for each state year in which a state did not enact its first substantive alternative teacher certification policy.

I also use the years of enactment to select the state-years to use in my event history analysis model. For state-year selection purposes, I create a years at risk variable. I code the years at risk variable as one for all years prior to and including the year in which a state passed its first substantive alternative teacher certification policy. I code yrsatrisk as zero for all state-years after that particular state passed its first substantive alternative teacher certification policy. In other words, I code yrsatrsk as one for the state-years during which the state is at risk of passing its first such policy, and I code yrsatrsk as one for the state-years during which the state is no longer at risk of passing its first such policy.

My source of data on the years of enactment is Feistritzer and Chester (1998, 2001). Feistritzer and Chester provide information about nearly 100 different state-level alternative certification programs in our country. In many cases, the weakest programs are not worth mentioning—for example, the most prolific state legislature, California, enacted a strong alternative certification program in 1983, but enacted a pre-internship teaching certificate program in 1998, a “sojourn credential” program circa 1978, a university intern credential program in 1967, an “eminence credential” program in the 1950s, and an emergency teaching certificate program in the 1940s. For states with multiple alternative teacher certification policies, I consider the details of the policies and I consider the number of teachers certified
pursuant to the policies before deciding which policy is the first substantive alternative teacher certification policy in each state. Table 6 lists the enactment dates and strength ratings of my choices of the first substantive alternative teacher certification policy in the states.

I note that year of enactment of the policies often differs from the year of implementation of the policies. Buck, Polloway and Robb (1995) surveyed all fifty states and found that by 1995 39 states had implemented alternative certification policies. By contrast, by that point in time 42 states had passed substantive alternative teacher certification policies. That is a difference of three states. There is an even larger difference between states with policies passed and states with policies enacted by the year 1992. Buck, Polloway, and Robb’s survey indicates that by the end of 1992, 30 states had implemented alternative teacher certification policies. The Feistritzer and Chester (1998, 2001) information shows that by that time 40 states had enacted such policies.

In this dissertation I focus mainly on teachers union influence in education policy. For that reason, I am more concerned with the enactment of alternative teacher certification policies than I am with the implementation of alternative teacher certification policies. Thus, theory guides me to choose the years of passage rather than the years of implementation for my analyses.

*The Policy Strength Model Dependent Variable*

For the policy strength model, I have three choices for operationalizing the dependent variable to capture the strength of each state’s first substantive alternative teacher certification policy. My choices include (1) reviewing the many alternative certification policies passed in the states and coding those policies for their facial strength and implementation success; (2) utilizing alternative certification information in the National Center for Education Information’s publication *Alternative Teacher Certification: A State by State Analysis* (Feistritzer and Chester
1998, 2001); (3) utilizing alternative certification information in the Thomas B. Fordham Foundation’s report “The Quest for Better Teachers: Grading the States” (Finn, Kanstoroom & Petrilli 1999). I easily eliminate the first choice—it far exceeds the time frame of my study.

The second and third choices both have advantages and disadvantages. The Feistritzer and Chester (1998) study includes the years that the various alternative certification programs were passed in each state and includes a description of every state-level alternative certification program in the country. The study also places the various programs into classes. Class A includes the fourteen programs around the country that are the most comprehensive—these programs are designed to attract college graduates into teaching, are not restricted to areas of shortage, and involve some formal instruction and mentoring for the new teachers. Classes B through D involve variations on the Class A theme. Class E programs are based at a college or university. Class F and G programs are emergency routes that allow warm bodies into the classroom without any on-going support or supervision, but with the requirement that the warm bodies engage themselves in study toward a traditional teaching certificate. Feistritzer and Chester refer to Class H as “special qualification” programs that allow “a well-known author or Nobel prize winner” to teach certain subjects. States that Feistritzer and Chester list as Class I have no alternative education programs.

I recode the Feistritzer and Chester classification scheme into a zero to five scale in an effort to measure the strength of the various alternative certification programs. I assign a value of five to states with Class A programs, a value of four to states with Class B & C programs (except the Class B programs that exist for shortage areas only); a value of three to states with Class D programs, a value of two to states with Class E programs, a value of one to states Class F-H
programs and Class B “shortage only” programs, and a value of zero to Class I states that have no alternative certification programs.

In their Fordham Foundation report, Finn, Kanstoroom and Petrilli (1999) enlist experts to help them prepare a 0-13.5 index based on the strength of the alternative certification programs in the various states. The education policy experts they enlist and their institutional affiliations include Dominic Brewer (Rand), Mary Butz (Manhattan Village Academy), Dan Goldhaber (Urban Institute), Eric Hanushek (University of Rochester), Tom Loveless (Harvard University), Michael Podgursky (University of Missouri), Michael Poliakoff (Pennsylvania Department of Education), Diane Ravitch (Brookings Institution and Manhattan Institute), Lewis Solmon (Goldwater Institute and Milken Family Foundation), J.E. Stone (East Tennessee State University), Robert Strauss (Carnegie Mellon University), and Herbert Walberg (University of Illinois at Chicago).

I encounter only one piece of missing data. Oregon refused to share information with the Fordham Foundation researchers. Filling in the missing Oregon data poses no great challenge because I notice that among the states with a value of four in my recoding of the Feistritzer and Chester classification scheme, a strong modal category of 5.25 (seven states) appears in the Finn, Kanstoroom & Petrilli (1999) work. Thus, I assign Oregon a 5.25 value.

Which variable better measures the strength of alternative certification programs around the country—the strength variable or the Fordham variable or a combination of the two? Finn, Hanstoroom and Petrilli (1999) note in their introduction that they (and presumably their experts) rely heavily on Feistritzer and Chester’s (1998) work. The correlation of the strength variable and Fordham variable, at .75, indicates that the two variables measure something that differs by only 25%.
The difference between the variables likely resides in two facts: (1) the Fordham variable incorporates not only the strongest alternative certification program in a state, but incorporates all of the alternative certification programs in a state; and (2) the Fordham variable incorporates not just the facial strength of the alternative certification programs, but also incorporates elements of the implementation of the programs, including whether information about the program is published and how much participants must pay to participate in any training aspects of the program. Because I find both variables to be valuable for different reasons, I combine the variables and use the combined variable in my policy strength model.

In order to run two separate models, one using all the state-year observations from states whose initial substantive teacher certification policy is strong and the other using all the state-year observations from states whose initial substantive teacher certification policy is weak, I note that the mean of the policy strength variable is 8.995. I consider states with policy strength values over 8.995 as having strong policies and states with policy strength values below 8.995 as having weak policies.

**Independent Variables**

*The Teachers Union Independent Variables*

Good measures of teachers union political strength are difficult to find. Mintrom (1997) notes, “not all state teachers unions publish membership statistics, making it difficult to construct a measure of union strength.” Mintrom suggests that instead of counting local union members, perhaps researchers should count the attitudes of teachers union leaders for a measure of union strength (Mintrom 1997, 753).

In his research, Mintrom counts the attitudes of teachers union leaders as a proxy for teachers union political strength. Mintrom measures the attitudes of union leaders by asking
education policy actors to judge the degree of opposition that teachers unions have shown to school choice in their state. I question Mintrom’s choice of measure. I suspect that Mintrom’s finding that teachers unions influence school choice policy might be a relic of the method he used to construct his teachers union political strength variable; Mintrom asks education policy actors to judge the degree of teachers union opposition in their state, and Mintrom finds what he asks—that those policy actors who judge teachers union opposition to be strong have experienced strong opposition from teachers unions.

I attempt to improve upon Mintrom’s measure of teacher union political strength. Rather than using one independent variable to measure teacher union political strength, I use two variables. Although I expected the two variables to be highly correlated in a positive fashion, they are just barely correlated in a negative fashion ($r = -.09$ for the event history dataset and $r = -.12$ for the policy strength dataset). Due to their near absence of correlation, I can use both variables without concern about multicollinearity. In the next paragraphs I describe the two variables and hypotheses that flow from the two variables.

One teacher union political strength variable I use is the percentage of legislators who list their non-legislative occupation as K-12 education. I find that information in two publications by the National Conference of State Legislatures (1987, 1996). Those publications include figures from the years 1976, 1986, 1993 and 1995. Because legislator occupational data is not available for every year of my time period, I extrapolate and interpolate in order to create appropriate data for the missing years.

I use the percentage of legislators who list their non-legislative occupation as K-12 education to test for teachers union control that presumably originates from efforts of teachers unions to elect union-friendly candidates to state legislatures. I assume that K-12 educators who
are elected to state legislatures bring with them a bias in favor of traditional methods of teacher certification. I assume that legislators who list their non-legislative occupation as K-12 education are union-friendly. I assume that teachers unions help elect union-friendly teachers to state legislatures.

Hence, I hypothesize that alternative teacher certification policies diffused first into states with small percentages of legislators who list their non-legislative occupation as K-12 education and later into states with large percentages of legislators who list their non-legislative occupation as K-12 education. I also hypothesize that states with large percentages of legislators who list their non-legislative occupation as K-12 education are more likely than other states to pass strong alternative certification policies and conversely states with small percentages of legislators who list their non-legislative occupation as K-12 education are more likely than other states to pass weak alternative certification policies.

The other teacher union political strength variable I use is the percentage of teachers who work under union-negotiated contracts. My data source here is Steelman, Powell, and Carini (2000). I use the same teachers union variable they use in their research about teachers unions and educational performance. Nelson, Rosen, and Powell (1996) used that same data in their research four years earlier.

I use the percentage of teachers who work under union-negotiated contracts to test for teachers union control that presumably originates from other efforts of teachers unions to influence state education policy. I presume that union membership predisposes teachers through their unions to influence state policy in the favor of traditional methods of teacher certification.

Hence, I hypothesize that alternative teacher certification policies diffused first into states with low levels of teachers union political strength as measured by small percentages of teachers
who work under union-negotiated contracts, and later into states with high levels of teachers union political strength as measured by large percentages of teachers who work under union-negotiated contracts. I also hypothesize that states with high levels of teachers union political strength as measured by large percentages of teachers who work under union-negotiated contracts are more likely than other states to pass strong alternative certification policies, and conversely states with low levels of teachers union political strength as measured by small percentages of teachers who work under union-negotiated contracts are more likely than other states to pass weak alternative certification policies.

Using two aspects of teachers union political strength in my model allows me to test for two separate aspects of teachers union political strength. One of the variables measures teachers union political strength within the legislature and the second variable measures teachers union political strength outside the legislature. Using these particular variables—one internal and the other external—helps me learn how my theory of the political strength of teachers unions blends with Weingast and Marshall’s (1988) internal theory of the policy process and Baumgartner and Jones’s (1993) external theory of the policy process.

Before deciding to use the percentage of legislators who list their non-legislative occupation as K-12 education and the percentage of teachers who work under union-negotiated contracts as independent variables in my model to measure teacher union political strength, I considered using several other variables as proxies for teacher union political strength.

First, I considered using the percentage of workers in a state covered by any union as a proxy for teachers union data (Statistical Abstract of the United States 1999; U.S. Department of Commerce 1991). After I discovered that the size of teachers union membership rolls, unlike regular union membership rolls, depends in great part on whether a particular state has a law
permitting bargaining by public school teachers, I rejected the idea of assuming that regular union membership could serve as a proxy for teachers union membership.

Second, I considered using Federal Election Commission Political Action Committee (PAC) records of contributions by teachers unions as a proxy for teachers union political strength. When exploring teachers union PAC records, however, I discovered that numbers from those records would not serve as a good proxy for teacher union political strength for several reasons. There are many different teachers unions per state. Wolak et al. (2002) found that there is an average of three unique education lobbying registrations per state. Not all of those education lobbying organizations are teachers unions; some are groups of education administrators. Some education lobbying organizations are groups of parents.

PAC money collected by a teachers union in one state is not necessarily spent on campaign finance in that state (Lieberman 2000; Berube 1988; Jasper 1985). The American Federation of Teachers’ (AFT) 2000 amended report covering the period from November 4, 2000 to December 31, 2000 reveals that AFT spent $590,865 during that period. The figure includes $254,774 to presidential candidate Al Gore, $106,742 to U.S. Senate candidate Hillary Clinton from New York, $8001 to a U.S. House of Representatives candidate from Rhode Island, and $11,124 each to 14 U.S. House Candidates from New York. No other candidate received more than $3000 from the AFT during that period. The National Education Association’s (NEA) 2000 year end report covering the period from October 22, 2000 to December 31, 2000 reveals that the NEA spent $249,358 during that period. Of that amount all but approximately $32,000 went to presidential candidate Al Gore. The remaining amount went to just seven U.S. House Candidates, one from each of seven different states.
Another reason not to use Federal Election Commission records of teachers unions’ in this dissertation is that fact that those records do not include information about state level political campaign finance. A review of state level teachers union political action committee finance reports would have exceeded the time frame of this research. For all these reasons, I decided not to use PAC money as a proxy for state-level teachers union political strength control.

Lastly, I considered using a dummy variable indicating whether a state has a law permitting collective bargaining by public school teachers. The dummy variable correlates well the percentage of teachers who work under union-negotiated contracts ($r = .84$) but the dummy variable does not provide as much information as the percentage variable. The percentage variable reveals not just whether teachers are permitted to unionize in each state but also reveals the percentage of teachers working under union-negotiated contracts in each state.

The Diffusion of Innovation Independent Variables

I run a separate event history analysis model for each of the seven diffusion variables. I compare the seven models. One of the diffusion variables is a simple time counter with a value of one for the year 1975 and a value of one additional unit for each subsequent year. The year 2000 has the value of 26. Because the time counter variable is skewed, I transform the variable by taking its square root. The transformation allows me to use the variable both in the event history analysis model and in the policy strength regression model.

Because I hypothesize that states learn from their geographic neighbors, I employ two neighbor-based diffusion variables. The first of these two variables consists of the number of adjacent states that have previously adopted an alternative teacher certification policy. Because different states have different numbers of neighbors, I also use a second variable consisting of the proportion of adjacent states that have previously adopted an alternative teacher certification
policy. For each of the two adjacent neighbor variables, I create a separate data point for each state for each year from 1975 to 2000.


The first region-based variable consists of the number of states in the region that have previously adopted an alternative teacher certification policy. Because different regions include different numbers of states, I also use a second variable consisting of the proportion of states in the region that have previously adopted an alternative teacher certification policy. For each of the two region variables, I create a separate data point for each state for each year from 1975 to 2000.

In an effort to ascertain whether diffusion of innovation occurs not on a neighbor or regional basis, I also employ two nationwide diffusion variables, one with the number of other states in the nation that have previously enacted substantive alternative teacher certification policies and the other with the proportion of states in the nation that have previously enacted such policies. These two nation-based variables treat the entire nation as one neighborhood or
region (Berry and Berry 1999). For each of the two nation variables, I create a separate data point for each state for each year from 1975 to 2000.

*The Teacher Shortage Independent Variable*


The Center for Educational Statistics publishes its Schools and Staffing Survey teacher shortage data by region. I use the regional teacher shortage figures for all states in each region. When I contacted the Center for Educational Statistics about the possibility of obtaining teacher shortage data by state, the statistician explained that the center has teacher shortage data by state, but cautioned me that that data was unweighted and the number of vacancies varied widely from zero to a relatively large number (Email communication with Kerry Gruber, January 12, 2004).

The statistician further cautioned me that “teacher shortage data are very difficult to get—everybody seems to think that there are teacher shortages but can’t prove it” (Email communication with Kerry Gruber, January 12, 2004). The statistician explained that when school districts answer the teacher shortage questions, they seem to focus on whether the position is filled by a highly qualified person rather than whether the position is filled at all. In other words, teacher shortages are mostly teacher “quality” shortages rather than teacher shortages—and quantifying teacher quality shortages is extremely difficult.
For these reasons, I consider the published regional data to be the best available teacher shortage data. When I analyze my results, I am aware of the fact that I base my regional diffusion variable on the same four regions—Northeast, Midwest, West, and South—that the National Center for Educational Statistics uses for its teacher shortage data.

I think the greater the teacher shortage in a state, the more likely the state is to adopt alternative methods of teacher certification. I also think that the greater the teacher shortage in a state, the more likely the state will adopt weak alternative teacher certification policies (stop-gap measures) instead of strong alternative teacher certification policies that resemble traditional methods of teacher certification.

*The Economic Independent Variables*

I employ an economic variable because I think there are links between a state’s wealth and teacher salaries, between teacher salaries and teacher shortages, and between teacher shortages and a state’s propensity to adopt alternative teacher certification policies. I also think that there are other links between a state’s wealth and the state’s propensity to adopt new policies.

I consider five different economic variables, all of which are available in state-year form from the State Politics & Policy Quarterly Data Resource (2004). Because some data for some state-years are missing from the dataset, I use extrapolation and interpolation to estimate the missing data. The economic state-year variables I consider are per capital income in constant 1996 dollars, education expenditures in thousands of current dollars, education expenditures as a percentage of personal income, education expenditures as a percentage of gross state product, and per pupil education expenditures in constant 1992 dollars.
In order to decide which of the five economic variables to use in my main models, I consider the theoretical implications of using each of the different economic variables, I examine the correlations of the economic variables with other variables in the model, and I run each of the economic variables in separate event history models and policy strength models.

I decide to use the per pupil education expenditures variable for several reasons. First, per pupil spending bears a closer relationship to teacher salaries than any of the other economic variables. Although the straight education expenditure variable performed well in the policy strength model, I reject that variable for the theoretical reason that it does not account for the number of students in a state.

Second, the education spending as a percentage of gross state product variable is correlated with legislative professionalism at .60, which is a correlation high enough to inflate the standard errors in my policy strength model. Per pupil spending, by contrast, is only correlated with legislative professionalism at .41. Because the per pupil spending variable correlates well with both per capital income in constant dollars \( r = .75 \) and education expenditures as a percentage of personal income \( r = .58 \), the per pupil spending variable arguably includes some of the information contained in those two variables.

Third, the per pupil spending variable performs no noticeably different than the other three remaining economic variables perform in the models. All of those four economic variables are significant in the policy strength models; none of them is significant in the event history analysis model. The pseudo \( R^2 \)’s of the event history models with those four other economic variables are similar (.14-.17). The adjusted \( R^2 \)’s of the policy strength models with those four other economic variables are similar (.20-.25). By contrast, I note that the adjusted \( R^2 \) of the policy strength model with the straight education spending variable, which model I reject, is .37.
I think that in states with relatively high per pupil spending, sufficient numbers of college
students are attracted into the teaching profession via the traditional certification route, and thus
the state is less likely to pass alternative teacher certification policies. I also think that the less a
state spends per pupil, the more likely the state will adopt strong alternative teacher certification
policies.

The Legislative Professionalism Independent Variable

Political scientists have found that legislative professionalism influences policy-making
in the states. The professionalism of a state legislature, as measured by legislator pay, days in
session, and number of staff members per legislator, explains state variances in the number of
uncontested seats in state legislator elections (Squire 2000). Where the professionalism level is
high, more candidates are likely to run for office. These results are in keeping with research on
political ambition by Black (1974) and Rohde (1979). Owings and Borck (2000) found that
legislative professionalism has an effect on state spending. State spending per capita is
significantly lower in less professionalized legislatures (Owings and Borck 2000). Citizen
legislatures depend on interest groups for information to a greater degree than professional
legislatures depend on interest groups for information (Berkman 2001).

Some evidence suggests that professional legislatures attract greater numbers than
expected of Democratic legislators. Fiorina (1994) hypothesizes that legislative professionalism
makes legislative service more attractive to Democratic candidates. He finds that every $10,000
increase in legislative compensation is associated with a one percent increase in Democratic
legislators. Fiorina (1999) uses state-specific times series measures of voter ideology in order to
show his earlier results were not spurious. He finds that the relationship between professionalism


Because teachers are professionals, I think that the greater the degree of legislative professionalism in a state, the less likely the state will pass alternative teacher certification policies. I base my thinking on the notion that one professional body (a state legislature) will respect and support another professional body (teachers). I recognize that another mechanism might explain the same results—perhaps larger states are the big liberal ones and their liberality causes them to experiment with alternative teacher certification policies. I also think that the greater the degree of legislative professionalism in a state, the more likely the state will adopt strong alternative teacher certification policies.

The Divided Government and Democratic Governor Dummy Variables

Divided government influences state policy-making (Krehbiel 1998; Edwards, Barrett, and Peake 1997). Bowling and Ferguson (2001) find that researchers should consider divided government and interest group activity in tandem. Chiou and Rothenberg (2003) find that researchers should not consider divided government in isolation from party, but rather should consider the both divided government and party. For these reasons, I include a divided government variable and a party variable in my models with the teachers union variables.
I create my divided government and democratic governor dummy variables from information included in the Divided Government in the States report by the National Conference of State Legislatures (1998). For the divided government dummy variable, I code a state-year as one if the party of the governor and the legislature are not all the same. For the democratic governor variable, I code a state-year as one if the governor is a Democrat.

*The Electoral Threat Index Independent Variable*

I create an electoral threat index by combining information about gubernatorial election years, state senate election years, and state house election years in the fifty states. To build the index, I use information from the National Conference of State Legislatures (2000), from the National Governor’s Association (2004), and from various state government websites.

My electoral threat index ranges from zero (no elections that year) to three (governor and all legislators up for election that year). I create a separate data point for every state-year in my study. If half of a senate or house is up for election in a given year, I add .5 instead of one to the index for that state year, except that I code each half of Nebraska’s unicameral legislature with a full one.

*The Percentage of Minority Students Independent Variables*

I include a percentage of minority students variable in some of my models. I obtain the minority data from the U.S. Department of Education, National Center for Education Statistics (2004). Because Hawaii’s racial statistics differ dramatically from those of the other states, I create a 10% minority figure for Hawaii. The 10% figure approximates the percentage of people in Hawaii who list their race as African-American or Hispanic.
I include the minority variables because I notice that many of the states that passed the earliest alternative teacher certification policies, including Texas, California, and New York (which is left-censored from the dataset), have high percentages of minority students. I also include the minority variables because I notice that alternative teacher certification programs have succeeded in attracting minority teachers who are willing to teach in areas avoided by many white teachers (U.S. Department of Education 2002; Feistritzer and Chester 2001, 14).

I suspect that teacher shortages might occur in part due to the reluctance of white teachers to teach in large inner-city schools filled with minority children. The Schools and Staffing Survey finds that large schools and schools with high minority enrollment have more difficulty filling teacher vacancies than do small schools and schools with low minority enrollments (U.S. Department of Education 1996). The report notes that from the school year 1987-1988 to the school year 1993-1994 the percentage of minority students increased from 28% to 32%, but the percentage of minority teachers increased only from 12% to 13%. The U.S. Immigration and Naturalization Service’s Office of Policy and Planning estimates that from 1990-2000, the numbers of unauthorized immigrants in the United States doubled, from 3.5 million to 7.0 million (U.S. Immigration and Naturalization Service 2004).

I use data from the U.S. Department of Education, National Center for Education Statistics (2004). Using the database-building feature of the website, I build a table with student minority percentage data for all states in 1995 and 2000. I use data from that table to create my change in minority percentage variable. I use the same minority data for every state-year involving a particular state. Because I find the minority data to be statistically insignificant, I do not obtain more data or use ad hoc techniques to build a complete dataset involving all state-years in my study.
The Legislative vs. Administrative Policy Dummy Independent Variable

I include a dummy variable in the policy strength model in an attempt to determine whether there is any significant difference between the passage of alternative teacher certification policies by state legislatures and the passage of such policies by state administrative agencies. I code the dummy variable as one for states whose first substantive alternative teacher certification policy was passed by the legislature, and I code the dummy variable as zero for states whose first substantive alternative teacher certification policy was passed by an administrative agency.

Data Preparation & Diagnostics

I prepare my data and diagnose problems with my models by testing for outliers, normality, heteroskedasticity, multicollinearity, linearity, and model specification errors. Maximum likelihood estimation, which I use for my event history analyses, bypasses many ordinary least squares regression issues including autocorrelation, heteroskedasticity, and nonlinearity (King 1998, 71). Because I use ordinary least squares regression analysis for my policy strength model, I need to consider those issues for the policy strength model.

In the following sections I describe my data preparation and diagnostic procedures and results.

Checking for Outliers

To test for outliers, I generate minimums, maximums, and standard deviations for all variables. I also graph the variables against each other to check for outliers. I find some outliers here and there on the graphs.
With regard to the event history analysis model, what concern me most are clusters of outlier state-years on the graph of per pupil spending and legislative professionalism. Upon further inspection, I find that the clusters represent state-years for California, New York, Arkansas, and New Jersey. California has high levels of legislative professionalism but low levels of per pupil spending. The other three states have high levels of both those variables.

I check for the leverage of state-year outliers in the event history model. I create a stem-and-leaf plot plus a list of the twenty state-years with the highest leverage for the event history analysis model. I am not too concerned about outlier state-years in the event history analysis model because none of the state-years are beyond the acceptable limit ((two times the number of independent variables plus 2) divided by the number of observations).

I am not too concerned with outlier states in the policy strength regression model. A stem and leaf plot of the studentized residuals shows a near-normal distribution. The highest and lowest residuals are not extreme. The highest is a 2.53 residual for New Hampshire. The lowest two are a –2.16 residual for Nebraska and a –2.15 residual for Louisiana. Although I would prefer that all the studentized residuals fall between 2 and -2; I am satisfied that all fall between 3 and -3.

When I run a leverage of outliers test on the policy strength model, I find that the states with the highest leverage are Nebraska, Louisiana, and New Hampshire, just as I expected. I run Cook's $d$ and DFITS tests to check for the influence of outliers. The results indicate that those three states plus West Virginia and Louisiana contribute a large influence to the model, but that influence is not very large. The Cokee's $d$ figures for those states—ranging from .09 for Nebraska to .12 for New Hampshire—are not much larger than the calculated Cook’s $d$ limit $(4/N)$, which is .08. The DFITS test results reveal that those five states have DFITS absolute
values ranging up to from 1.11 to 1.27, which is somewhat beyond the DFITS limit for the model of .94 (calculated from the DFITS formula of two times the square root of the number of independent variables divided by the number of observations).

**Checking for Normal Distribution**

I check whether each variable has a normal distribution. I find that all the variables have normal distributions except the time counter variable. Because the time counter variable lacks a normal distribution, I transform the variable by using the square root of the time counter variable. Transformations of variables are acceptable unless the relative size of the intervals between the data points contains information of theoretical importance. In this case, I make a theoretical determination that the yearly intervals are not important. In other words, I do not care whether the interval between 1979 and 1980 is exactly the same size as the interval between 1990 and 1991. When I transform the variable I lose nothing of theoretical importance and I gain a more normal distribution that will satisfy the normal distribution assumption underlying regression analysis.

**Checking Normality of Residuals**

To check for the normality of residuals from the policy strength model, I use several available techniques including a Kernel density estimate, a P-P plot, a P-Q plot, and a Shapiro-Wilk $w$ test. Visual inspection of the Kernel density test results reveals a normal distribution of the studentized residuals. The P-P plot, which is sensitive to the middle ranges of the residuals, looks fine. The P-Q plot, which is sensitive to the tails of the ranges of the residuals, shows slight variation at the tails. The Shapiro-Wilk $w$ test for normality of residuals has acceptable $p$-values
for all non-dummy variables. For these reasons, I find the residuals from my policy strength model are normal.

**Checking for Heteroskedasticity of Residuals**

To check for heteroskedasticity of residuals, I use several techniques including a residuals versus fitted values graph and two other tests for heteroskedasticity. The residuals versus fitted values graph reveals no heteroskedasticity. The Breusch-Pagan/Cook-Weisberg test for heteroskedasticity with a null hypothesis of a constant variance reveals an acceptable $p$-value.

I generate an added variable plot in order to plot, for each independent variable, the dependent variable of my policy strength model against the studentized residuals. All of the added variable graphs appear satisfactory.

**Checking for Multicollinearity**

For my event history analysis model dataset comprised of state-years as observations and for my policy strength model dataset comprised of using states as observations, I conduct several tests for multicollinearity including an inspection of the correlations between the variables, a Klein test, a VIF test, a tolerance test, and a test for multicollinearity in the entire model. Multicollinearity presents a problem in regression equations because a high correlation between independent variables inflates the standard errors. If the standard errors are inflated, we are more likely to fail to reject a false hypothesis and thus commit a Type II error.

When conducting the ocular test for multicollinearity, I examine the correlations between the independent variables I use in the models. Correlations over .6 indicate that two independent variables suffer from multicollinearity. The correlation matrix reveals than none of the independent variables are correlated at the worrisome .6 level. The highest correlations among
the independent variables are a .57 correlation between shortage percentage and the time counter in the event history analysis model dataset and a .53 correlation between per pupil spending and percentage of teachers who work under union-negotiated contracts in the policy strength model dataset.

In order to conduct the Klein test for multicollinearity, I regress each independent variable on all the other independent variables and examine $R^2$ of each regression. An $R^2$ over .6 in any of the Klein regressions indicate that the independent-turned-dependent variable suffers from multicollinearity. The Klein test reveals that none of the independent variables, when regressed on all the other independent variables, has an $R^2$ at the troublesome .6 level. The highest $R^2$ among the independent variables in the dataset of state-years used in the event history analysis model, when regressed separately on each of the other independent variables, is .52 for per pupil spending. The next two highest are .48 for the time counter and .41 for teacher shortage. The highest $R^2$ among the independent variables in the dataset of states used in the policy strength model, when regressed separately on each of the other independent variables, is .57 for percentage of teachers who work under union-negotiated contracts. The three next highest are .54 for per pupil spending, .48 for minority percentage, and .47 for legislative professionalism.

The Klein test results are consistent with other multicollinearity test results. The variance inflation factor result for the event history model, at 1.49, is substantially less than the concern level of 10 and the mean tolerance of .67 is substantially more than the concern level of .1. The variance inflation factor result for the policy strength model, at 1.62, is substantially less than the concern level of 10 and the mean tolerance of .62 is substantially more than the concern level of .1. Other results show that the multicollinearity in the model as a whole is within acceptable
limits; the determinate of the correlation matrix is only .19 for the event history model dataset and .20 for the policy strength model dataset. For the above reasons, I find no multicollinearity problems with the models.

*Checking for Linearity*

In order to check for linearity in my policy strength model, I run the main model and then generate an augmented component plus residual plot for each independent variable except the dummy variables. The resulting plots show various degrees of linearity.

*Checking for Model Specification Errors*

To check for model specification errors, I create two new variables (_hat and _hat-squared) and refit the model with those variables to test the whether the addition of those variables is significant. I also use the Ramsey RESET test to check whether any variables have been omitted from the model. The null hypothesis of both tests is that the model has no omitted variables. Thus, all p-values should be insignificant. If the p-values are significant, the model is not correctly specified.

The first model specification test result reveals that the event history analysis model suffers from model specification error. The p-values results for the event history analysis model are zero and .04 when they should be over .05 if the model is correctly specified. The results reveal that the policy strength model is correctly specified (p-values = .20 and .75). The Ramsey RESET results also reveal that the policy strength model is correctly specified (p-value = .46).

**Conclusion**

In this chapter I described the data and data sources I use to test my theory and hypotheses. My event history model dependent variable is the usual event history dependent
variable. My policy strength model dependent variable is a measure of the strength of the various alternative teacher certification policies in the states.

I use two independent variables to measure the political influence of teachers unions—one to measure influence operating primarily outside the legislature (percentage of teachers in the state who work under union-negotiated contracts), and the other to measure influence operating primarily inside the legislature (percentage of legislators in the state who list their non-legislative occupation as K-12 education). My other independent variables include seven different variables to measure policy diffusion and nine variables to control for various educational, political, and economic conditions.

I employ various data preparation and diagnostic procedures to test for outliers, normality, heteroskedasticity, multicollinearity, linearity, and model specification errors. I find no large problems as a result of that testing, except I find that the event history model suffer from model specification error.
CHAPTER VI

RESULTS

Introduction

In this chapter, I discuss the results of both models, I discuss the performance of the diffusion variables in the event history analysis model, and I examine each of the six hypotheses. The first two hypotheses use data about the passage of alternative teacher certification policies in order to test my theory about the political strength of teachers unions. The third and fourth hypotheses use data about the strength of alternative teacher certification policies in order to test my theory about the political strength of teachers unions. The fifth and sixth hypotheses test whether state legislatures and state administrative agencies tend to pass different alternative teacher certification policies.

I also discuss other results that flow from my work, including information evident in the matrix I used to determine the 1975-2000 time period of my study and information evident from four models dividing the observations along two parameters: the legislative/administrative dummy variable and the policy strength variable.

In the concluding chapter, I explain what all the results say about my theory of teachers union political strength and two theories that support my theory—Baumgartner and Jones’s (1993) punctuated equilibrium theory and Weingast and Marshall’s (1988) distributive theory.

The Diffusion Results

I note that I make no hypothesis about any diffusion mechanisms that might have operated to spread alternative teacher certification policies among the fifty states. I also make no hypothesis about whether adjoining states or regions served as paths of diffusion for alternative
teacher certification policies. Nevertheless, because in the event history model I employ various diffusion variables to control for the effects of unnamed and unmeasured mechanisms that vary through time, I will comment on how the diffusion variables perform in my models.

I ran seven different event history analysis models, each with a different diffusion variable. The diffusion variable in six models was statistically significant at the .01 level, and the diffusion variable in one model, the model using the proportion of adjacent states with alternative teacher certification policies, was statistically significant at the .05 level. Thus, I find evidence that alternative teacher certification policies diffused in all fashions represented by the variables—via neighborhoods of adjacent states, via neighborhoods of regional states, and via the neighborhood of the nation as a whole.

The three event history analysis models with diffusion variables showing the proportion of previous-adopter states (rather than the number of previous-adopter states) can be compared against each other. The coefficients of the diffusion variables in those models are 1.486, 1.786, and 2.609 for the adjacent neighborhood, regional neighborhood, and national neighborhood, respectively. The pseudo $R^2$s of the diffusion variables in those models are .0968, .1114, and .1272 for adjacent neighborhood, regional neighborhood, and national neighborhood, respectively. The coefficients and the pseudo $R^2$s reveal that the national neighborhood model performs best. As the internet and other modes of communication have decreased the cost-effective distance between professionals, and as national organizations and national journals have disseminated information all over the nation on alternative teacher certification policies and programs, perhaps the nation has become one big neighborhood. My thoughts in this regard accord with Mooney (2001) and others who theorize that as information on an issue “is nationalized through think tanks and other national organizations, then learning from bordering
states may be no more common than learning from states across the country” (Mooney 2001, 119).

Because the time counter model has a higher pseudo $R^2$ (.1443) than even the national neighborhood model and because my research focuses primarily on the political strength of teachers unions, I am not concerned about the particular path of diffusion in this case. Because the time counter variable best controls for time variance, I consider the model with the time counter variable to be my event history analysis model.

As an additional test of whether the hazard rate varies with time, I ran the event history analysis model without the time counter variable. I then used a log likelihood ratio test to compare the models with and without the time counter variable in order to test the null hypothesis that the hazard rate does not vary with time. The log likelihoods of the two models are –138.75 and -156.24, respectively. The log likelihood ratio test $\chi^2$ test result (.001) indicates that the hazard rate varies with time. The result is consistent with the significance of the diffusion variables in the seven diffusion models, each of which employs a different diffusion variable. For these reasons, I include the time counter variable in the event history analysis model.

The Event History Model Results

The first two hypotheses relate to my event history analysis of the passage of alternative teacher certification policies in the states. The first hypothesis uses the percentage of legislators who list their non-legislative occupation as K-12 education as a proxy for teachers union political strength. The second hypothesis uses the percentage of teachers who work under union-negotiated contracts as a proxy for teachers union political strength. My event history analysis hypotheses are as follows.
Hypothesis One: Alternative teacher certification policies diffused first into states with low levels of teachers union political strength as measured by small percentages of legislators who list their non-legislative occupation as K-12 education and later into states with high levels of teachers union political strength as measured by large percentages of legislators who list their non-legislative occupation as K-12 education.

Hypothesis Two: Alternative teacher certification policies diffused first into states with low levels of teachers union political strength as measured by small percentages of teachers who work under union-negotiated contracts, and later into states with high levels of teachers union political strength as measured by large percentages of teachers who work under union-negotiated contracts.

When I ran preliminary versions of my dataset using regression analysis instead of event history analysis, using states as observations instead of using state-years as observations, and using variables pegged to the year of enactment of the policies instead of using time-varying variables, my results confirmed both these hypotheses. For reasons stated in Allison (1984), I expanded my dataset and now employ event history analysis. My event history analysis results neither prove nor disprove my first and second hypotheses. I report the results in Table 3.

Only three variables in the event history analysis model are statistically significant: the time counter variable, the teacher shortage variable, and the legislative professionalism variable. The significance of the latter two variables, though not central to my theory, confirms my expectations that (1) teacher shortages around the country influence the passage of alternative teacher certification policies and (2) more professionalized legislatures are more likely to pass alternative teacher certification policies than are less professionalized legislatures.
The event history analysis model as a whole serves as a good predictor of the dependent variable. When I set the prediction cutoff to the ratio between the number of state-years with policy adoptions and the total number of state-years in the model (.057), I find that the model predicts the dependent variable in 90% of the state-years with policy adoptions and predicts the dependent variable in 66% of the total state-years used in the model. I employ the ratio cutoff rather than the usual .50 cutoff because event history analysis models, by their nature, include many more non-adoption observations than adoption observations.

In order to clarify the event history analysis results, I analyze what might happen to a variable when all other variables are held at their mean and the variable in question is set at user-specified levels. Table 3 includes the results of testing what happens when each independent variable is set to its minimum and maximum levels. In the follow paragraphs I discuss the results in terms of setting the independent variables of interest to one standard deviation above and one standard deviation below their means.

Both of the teachers union political strength variables, though statistically insignificant, operate in the hypothesized direction. Of the two variables, the percentage of teachers who work under union-negotiated contracts appears to have a slightly larger influence on the passage of alternative teacher certification policies. A one standard deviation decrease in the percentage of teachers who work under union-negotiated contracts increases the probability of passage of an alternative teacher certification policy in a particular state-year from 2.9% (with a 95% confidence range of 1.7% to 4.7%) to 3.8% (with a 95% confidence range of 1.9% to 6.0%). A one standard deviation increase in the percentage of teachers who work under union-negotiated contracts decreases the probability of passage of an alternative teacher certification policy in a
particular state-year to 2.4% (with a 95% confidence range of 1.9% to 4.3%). The large ranges illustrate the statistical insignificance of the variable.

The results for the other teachers union political strength variable are similar. A one standard deviation decrease in the percentage of legislators who list their non-legislative occupation as K-12 education increases the probability of passage of an alternative teacher certification policy in a particular state-year from 2.9% (with a 95% confidence range of 1.7% to 4.7%) to 3.6% (with a 95% confidence range of 3.0% to 5.8%). A one standard deviation increase in the percentage of legislators who list their non-legislative occupation as K-12 education decreases the probability of passage of an alternative teacher certification policy in a particular state-year to 2.5% (with a 95% confidence range of 1.2% to 4.6%). The large ranges illustrate the statistical insignificance of the variable.

Of the three statistically significant variables in the event history model, the time counter variable has the greatest influence. State-years that occurred earlier in time (at the 10th percentile level of time) had a .2% probability of passing an alternative teacher certification policy (with a 95% confidence range of 0% to .4%). The probability of passing a policy increased to 18.4% for state-years at the 90th percentile level of time (with a 95% confidence range of 24.5% to 66.6%).

Due to the strong results from the time counter variable, I suspect that either (1) the time counter variable is operating as a proxy for omitted variables that operate through time or (2) the time counter variable introduces bias into the model. My model specification error test results confirm the former proposition. I find support for the latter proposition in Mooney (2001). Mooney suggests that the time counter method and the year dummy method of accounting for time both are biased in favor of finding diffusion effects. Mooney develops yet another method
to use—the “average proportion of adjacent adopters” method. If my event history model results were more robust, I would attempt Mooney’s method.

The other two statistically significant variables in the model are teacher shortages and legislative professionalism. A one standard deviation increase in teacher shortages increases the probability of passage of an alternative teacher certification policy in a particular state-year from 2.9% (with a 95% confidence range of 1.7% to 4.7%) to 4.6% (with a 95% confidence range of 2.6% to 7.4%). A one standard deviation decrease in teacher shortages decreases the probability of passage of an alternative teacher certification policy in a particular state-year to 1.9% (with a 95% confidence range of .8% to 3.9%). The teacher shortage results confirm my expectation that the greater the teacher shortage, the more likely a state is to pass an alternative teacher certification policy.

The legislative professionalism variable results contradict my expectation that legislatures with greater degrees of professionalism are less likely to pass alternative teacher certification policies. A one standard deviation increase in legislative professionalism increases the probability of passage of an alternative teacher certification policy in a particular state-year from 2.9% (with a 95% confidence range of 1.7% to 4.7%) to 4.4% (with a 95% confidence range of 2.5% to 6.8%). A one standard deviation decrease in legislative professionalism decreases the probability of passage of an alternative teacher certification policy in a particular state-year to 2.0% (with a 95% confidence range of .8% to 3.9%).

In summary, my event history analysis model results neither prove nor disprove my first and second hypotheses about the political strength of teachers unions. From the event history analysis model results, I am unable to conclude that teachers unions exercise political power in education policy-making.
The Policy Strength Model Results

Due to the disappointing event history analysis results, I supplement the event history analysis with an examination of the strength of the different alternative teacher certification policies. My policy strength model overcomes a difficulty inherent in the event history analysis method—its failure to account for differences among policies. My policy strength model hypotheses are as follows.

Hypothesis Three: States with high levels of teachers union political strength as measured by large percentages of legislators who list their non-legislative occupation as K-12 education are more likely than other states to pass strong alternative certification policies and conversely states with low levels of teachers union political strength as measured by small percentages of legislators who list their non-legislative occupation as K-12 education are more likely than other states to pass weak alternative certification policies.

Hypothesis Four: States with high levels of teachers union political strength as measured by large percentages of teachers who work under union-negotiated contracts are more likely than other states to pass strong alternative certification policies, and conversely states with low levels of teachers union political strength as measured by small percentages of teachers who work under union-negotiated contracts are more likely than other states to pass weak alternative certification policies.

Table 4 contains the results of the policy strength analysis model. Only two variables in the policy strength model are statistically significant—percentage of teachers who work under union-negotiated contracts and legislative professionalism. The divided government variable approaches statistical significance \((p<.135)\). Table 4 also includes the results of testing what happens when I set each independent variable at its minimum and maximum levels. In the follow
paragraphs I discuss the results in terms of setting the independent variables of interest to one standard deviation above and one standard deviation below their means.

Surprisingly, the policy strength model neither supports nor disproves the third hypothesis but disproves the fourth hypothesis. Opposite to what I had theorized, states with large percentages of teachers who work under union-negotiated contracts are more likely than other states to pass weak alternative teacher certification policies. A one standard deviation increase in the percentage of teachers who work under union-negotiated contracts decreases the policy strength from 8.94 (with a 95% confidence range of 7.72 to 10.22) to 7.27 (with a 95% confidence range of 5.08 to 9.34). A one standard deviation decrease in the percentage of teachers who work under union-negotiated contracts increases the policy strength to 10.94 (with a 95% confidence range of 8.66 to 13.29).

Although the percentage of legislators who list their non-legislative occupation as K-12 education was statistically insignificant, the results for that variable were in the hypothesized direction; states with large percentages of legislators who list their non-legislative occupation as K-12 education are more likely than other states to pass strong alternative teacher certification policies, which most closely resemble the rigor of traditional methods of teacher certification. A one standard deviation increase in the percentage of legislators who list their non-legislative occupation as K-12 education increases the policy strength from 8.94 (with a 95% confidence range of 7.72 to 10.22) to 9.31 (with a 95% confidence range of 7.41 to 11.16). A one standard deviation decrease in the percentage of legislators who list their non-legislative occupation as K-12 education decreases the policy strength to 8.60 (with a 95% confidence range of 6.79 to 11.48). The overlapping confidence ranges illustrate the statistical insignificance of the variable.
Legislative professionalism has the largest influence on the strength of alternative teacher certification policies. A one standard deviation increase in legislative professionalism increases the policy strength from 8.94 (with a 95% confidence range of 7.72 to 10.22) to 10.94 (with a 95% confidence range of 8.90 to 13.01). A one standard deviation decrease in legislative professionalism decreases the policy strength to 7.01 (with a 95% confidence range of 4.97 to 9.16).

These results confirm my expectation that states with high degrees of legislative professionalism adopt strong alternative teacher certification policies that resemble traditional methods of teacher certification. These results also confirm research by Berkman (2001) showing that legislatures with high degrees of professionalism depend less on interest groups for information than other legislatures depend on interest groups for information. To the extent that teachers unions might have exercised political power to prevent the passage of strong alternative teacher certification policies in the states, teachers unions have had less success exercising that political power in states with highly professional legislatures.

The variable with the next largest influence on policy strength is divided government, the coefficient of which approaches statistical significance (p<.135). The results show that an alternative teacher certification policy is likely to be weaker (8.00, with a 95% confidence range of 6.19 to 9.74) when passed by a divided government and stronger (10.39, with a 95% confidence range of 8.21 to 12.50) when passed by a unified government. This is in line with my expectations. Because divided government sometimes hinders policy innovation, I had expected that legislatures would pass weak policies under divided government conditions and strong policies under united government conditions.
In summary, the policy strength model results contradict the fourth hypothesis and neither support nor disprove the third hypothesis.

Bureaucratic Control Analysis Results

Hypothesis Five: State legislatures exercise control over education administrative agencies and thus prevent those agencies from passing weak alternative teacher certification policies that represent a large departure from traditional methods of teacher certification.

Hypothesis Six: In the alternative, I hypothesize that state legislatures exercise control over education administrative agencies and thus prevent those agencies from passing alternative teacher certification policies except weak policies that serve primarily as stop-gap measures.

I employ two statistical techniques in an attempt to find answers to my fifth and sixth hypotheses. First, I examine the legislative/administrative dummy variable in my policy strength model. Because the variable is insignificant and because the coefficient on the variable is nearly zero, the model reveals little about whether alternative teacher certification policies passed by legislatures tend to be stronger (resembling traditional certification methods) or weaker (resembling stop-gap measures) than alternative teacher certification policies passed by administrative agencies. Other results show that as the dummy variable changes from minimum to maximum, the strength of the alternative teacher certification policy stays virtually the same, decreasing slightly from 8.99 (with a 95% confidence range of 7.11 to 10.88) to 8.93 (with a 95% confidence range of 6.93 to 10.94). The legislative/administrative dummy variable tells us almost nothing about the fifth and sixth hypotheses.

Second, I run two difference of means tests. In one difference of means test, reported in Table 7, I divide the dataset into two groups: states whose legislatures passed their alternative teacher certification policy and states whose administrative agencies passed their policy. I then
run a difference of means test on the policy strength variable. The difference of means test is significant at the .10 level \((p<.09)\). Thus, it appears that legislative enactments tend to be stronger than administrative enactments. This tends to disprove the fifth hypothesis but tends to support the sixth hypothesis.

In the second difference of means test, reported in Table 8, I do the reverse. I divide the dataset into two groups: states with strong policies and states with weak policies. I run a difference of means test on the legislative/administrative dummy variable. From these results, which are significant \((p<.02)\), I notice that weak alternative teacher certification policies are more likely to have come from administrative agencies than from legislatures. I also notice that strong alternative teacher certification policies have almost a fifty-fifty chance of having come from the state legislature or from an administrative agency. This tends to disprove the fifth hypothesis but tends to support the sixth hypothesis.

Although an examination of the legislative/administrative dummy variable yields inconclusive results, the difference of means test results reveal that to the extent that state legislatures exercise control over education administrative agencies, state legislatures exercise that control by preventing agencies from passing alternative teacher certification policies except weak policies, which serve primarily as stop-gap measures.

Results from the Matrix of Different Time Periods

Table 5 is a matrix that include results from 96 event history analysis models, each using a different time period. I include the matrix because it reveals that the choice of a time period has a big effect on the results. Big changes occur in pseudo \(R^2\), in observations used, and in significance of variables when the time periods change. The matrix in Table 5 shows patterns that emerge regarding pseudo \(R^2\) and the number of observations. The pseudo \(R^2\) is largest for
time periods ending in 1991 and smallest for time periods ending in 2001. The pseudo $R^2$ is largest for time periods beginning in 1976 and smallest for time periods beginning in 1982. Patterns in the number of observations mirror the fact that states drop out of the riskset once they pass an alternative teacher certification policy.

Event history analysts should choose the time periods of their research carefully. Creating a matrix of the effects of using different time periods not only allows the analyst to see differences clearly, but also allows the analyst to observe trends in the matrix.

Results from a Four Models Dividing the Dataset

I supplement the event history analysis with an examination of the differences between policies passed by state legislatures and policies passed by state administrative agencies. For this examination, I run a series of four models, dividing the dataset two ways based on whether a policy was passed by a state legislature or by an administrative agency and based on whether a policy is strong or weak. I show my results from the two pairs of twin models in Tables 9 and 10.

From reviewing the twin-model results in Table 9, I observe that the time counter has a larger coefficient in the model with strong alternative teacher certification policies, and thus perhaps stronger alternative teacher certification policies became more prevalent with the passage of time. From Table 9 I also learn that the teacher shortage variable has a larger coefficient in the model with weak alternative teacher certification policies, which result I might expect if I consider that the weakest alternative teacher certification policies serve as stop-gap measures.

From reviewing the twin-model results in Table 10, I observe that the model limited to observations that have a value for the legislative or administrative dummy variable performs better than the model with all observations. This might be because the former model excludes
observations from right-censored states, which are the states that did not pass alternative teacher
certification policies before or during the 1975-2000 period of the event history analysis. I also
observe that these four models, which do not account for the strength of the alternative teacher
certification policies in either the left hand or the right hand side of the equation, give us little
statistically significant information.

Conclusion

In conclusion, my results disprove the fourth hypothesis and support the sixth hypothesis.
Opposite to what I had theorized, states with large percentages of teachers who work under
union-negotiated contracts are more likely than other states to pass weak alternative teacher
certification policies. A one standard deviation increase in the percentage of teachers who work
under union-negotiated contracts decreases the policy strength from 8.94 (with a 95% confidence
range of 7.72 to 10.22) to 7.27 (with a 95% confidence range of 5.08 to 9.34). Pursuant to the
sixth hypothesis, I find that state legislatures exercise control over education administrative
agencies by preventing those agencies from passing alternative teacher certification policies
except those policies that serve primarily as stop-gap measures (weak policies).
CHAPTER VII

CONCLUSION

A Theory of Teachers Union Political Control

My results inform my theory that teachers unions have political strength. Although my event history model results were inconclusive with respect to the teachers union political strength variables, my policy strength model results reveal that states with large percentages of teachers who work under union-negotiated contracts are more likely than other states to pass weak alternative teacher certification policies. Although this result is contrary to my fourth hypothesis, this result supports the idea that teachers unions operate in the education policy-making arena.

My diffusion variable was significant at the .01 level. When I examine the diffusion results, I find that what happened in the alternative teacher certification policy area over the 1975-2000 period of my study resembles aspects of both Baumgartner and Jones’s (1993) punctuated equilibrium theory and Weingast and Marshall’s (1988) distributive theory. Policy diffusions, in a sense, are slow versions of Baumgartner and Jones’s punctuated equilibrium theory. Baumgartner and Jones apparently agree. They note, “policy diffusion, with its S-shaped curve, is remarkably like a punctuated equilibrium model in which the system shifts rapidly from one stable point to another (Baumgartner and Jones 1993, 17).

A key assumption of the punctuated equilibrium theory involves the dual nature of policy processes—there are periods of stability and there are periods of punctuation. I believe that the “punches” of punctuated equilibrium theory result at times when actors inside the legislature are ready to “punch” the equilibrium. When legislators prepare to make big policy changes, they put themselves and similarly-interested legislators on target committees. Thus, prior to policy
punctuations, and perhaps all the time in policy areas prone to big punctuations, committee composition comports with Weingast and Marshall’s distributional theory.

I view my variable measuring the percentage of legislators who list their non-legislative occupation as K-12 education as a variable that measures not only the percentage of teachers in the legislature, but also as a variable that arguably measures the percentage of teachers on education committees. Weingast and Marshall (1988), Krehbiel (1991), Cox and McCubbins (1993) all found that legislators with interests in education serve on education committees in larger proportions than their proportion in the legislature as a whole. Thus, in a sense, if that variable, which measures teachers union political strength by using the proxy of legislators who list their non-legislative occupation as K-12 education, had been significant in the event history analysis model and the policy strength model, the results would have accorded with Weingast and Marshall’s distributional theory. Significance of the variable would have shown that large numbers of legislators who list their non-legislative occupation as K-12 education, and thus presumably large numbers of teachers serving on state legislative education committees, lead to strong alternative teacher certification policies. Strong alternative teacher certification policies are not merely stop-gap measures; strong alternative teacher certification policies are policy punctuations that change the way we choose and train new teachers.

I view my variable measuring the percentage of teachers who work under union-negotiated contracts as a variable that measures influences outside the legislature. Had this variable been statistically significant in the event history analysis model, the results would have supported the idea that teachers unions have slowly lost political strength. Truman predicts that just as teachers unions gain power during times society holds them in favor, they lose power during times society holds them in less favor (Truman 1951, 250). Kerchner, Koppich, and
Weeres (1997) contend that teachers unions have been vulnerable in recent years because they are “utterly dependent on the existing structure and power alignments within public education: a massive, rule-bound, hierarchical public bureaucracy that is increasingly seen as anachronistic and ill-fitted to the requirements of post-industrial society” (Kerchner, Koppich, and Weeres 1997, 34).


Just as Baumgartner and Jones (1993) might have predicted, teachers unions have been responding to the shift in attention by arguing for teacher control over teacher licensing. Ballou and Podgursky (2000) note a growing trend among teachers unions to seek control of their own licensing and certification standards in a manner similar to the control that doctors, lawyers, and many other professionals possess over their own training and licensure. Chubb and Moe (1990) note that self-regulating boards of all types “tend to use public authority in their own self-interest to restrict entry and enhance their incomes.” The creation of separate teacher certification boards falls within Baumgartner and Jones’s punctuated equilibrium theory; policy punctuation often
include not only changes in intensities of interest and changes in public images associated with
the issue, policy punctuations also include changes in institutional jurisdictions and as well as
creation of new institutions.

Although my theory is that teachers unions have political strength, if we consider that
teachers unions oppose forms of alternative teacher certification that differ substantially from
traditional methods of teacher certification, my diffusion results illustrate what might be
categorized as a slow decline of that power during the 1975-2000 period in which almost all
states adopted alternative teacher certification policies that arguably oppose the interests of
teachers unions. It is possible that teachers unions and teachers who work under union-negotiated
contracts might have influenced education policy in the 1960s and 1970s as many education
writers presume. It is also possible that teachers unions and teachers who work under union-
negotiated contracts still influence education policy. My results, however, do not reveal whether
teachers unions influence education policy-making in the alternative teacher certification area.

Perhaps my results fail to provide answers because I focus on the passage rather than the
implementation of alternative teacher certification policies. The time between passage and
implementation can vary substantially. Implementations vary in size and effect; alternative
teacher certification programs in some states have certified large numbers of new teachers but
alternative certification programs in others states, notably Maryland, have certified few teachers
(Abell 2001). Perhaps measurement of the implementation, rather than the passage, of alternative
teacher certification policies would yield different results concerning the political strength of
teachers unions. Because some states have no alternative teacher certification programs, the
implementation numbers likely vary widely from state to state. Currently one-third of all new
teachers enter the profession through alternative teacher certification programs (Rose 2002; Blair 2003).

Perhaps my results fail to provide answers due invalidity of my measures of teachers union political strength. The two measures I use as proxies for teachers union political strength—the percentage of legislators who list their non-legislative occupation as K-12 education and the percentage of teachers who work under union-negotiated contracts—are just barely correlated in a negative fashion ($r = -.09$ for the event history dataset and $r = -.12$ for the policy strength dataset). Due to the near absence of correlation between the variables, I was able to use both in each model without concern about multicollinearity. The near absence of correlation, however, might indicate that the measures are invalid. Even assuming that both measures together adequately measure teachers union political strength, each measure alone measures only half of teachers union political strength.

Future Research

Many questions remain with regard to teachers union political strength and alternative teacher certification policies. Future researchers might attempt to find better measures of teachers union political strength, might discover and measure omitted variables, and might attempt to find better measures of teacher shortages.

My results indicate that teacher shortages influence both whether a state passes an alternative teacher certification policy and the strength of the policy. Perhaps future research should focus on factors that lead to teacher shortages. One such factor might involve the changing demographics of our society.

Since the 1960s and 1970s, women have increasingly entered professions that in the past were the exclusive domains of men. Women are no longer limited to careers as nurses,
secretaries, and teachers. Perhaps the exodus of women from traditionally female careers areas such as teaching and nursing into more lucrative career areas has contributed to teacher shortages and thus contributed to the passage of alternative teacher certification policies.

Another factor that might have contributed to the passage of alternative teacher certification policies is the increasing percentage of college graduates in our country. In 1950, only 7.7% of adults had completed four years of college or more. That figure grew to 12% in 1960, to 16.4% in 1970, to 22.5% in 1980, and to 23.2% in 1990. The increasing size of the supply of college graduates likely prompted state policy makers to find ways to allow college graduates to fill teaching vacancies without spending additional years in college.

Another factor that might contribute to teacher shortages is the changing racial demographics in our country. The Schools and Staffing Survey (1996) finds that large schools and schools with high minority enrollments have a harder time filling teacher vacancies than do small schools and schools with low minority enrollments (U.S. Department of Education 1996). The report notes that from the school year 1987-1988 to the school year 1993-1994 the percentage of minority students increased from 28% to 32%, but the percentage of minority teachers increased only from 12% to 13% (U.S. Department of Education 1996). The U.S. Immigration and Naturalization Service’s Office of Policy and Planning estimates that from 1990 to 2000, the numbers of unauthorized immigrants in the United States doubled, from 3.5 million to 7.0 million (U.S. Immigration and Naturalization Service 2004).

Racial demographic factors might also contribute to the success of some alternative teacher certification programs. Some alternative teacher education programs measure their success partly in terms of how well they attract minority candidates into the teaching profession. In Texas, where 91% of teachers are white, 41% of teachers entering the profession through
alternative certification programs are from minority groups (U.S. Department of Education, 2002).

I included the minority variables in my policy strength model after I noticed that many of the states that passed the earliest alternative teacher certification policies, including Texas, California, and New York, have high percentages of minority students. I suspect that insignificance of the minority variables might be due in part to the left-censoring of New York from the dataset. I also suspect that the insignificance of the minority variables might be due in part to the fact that I did not weigh the states in order to account for population or to account for numbers of teachers certified via alternative methods.

Future researchers might examine whether people trained as teachers choose whether to be employed as teachers depending on whether their race matches the race of the children in schools with teacher vacancies. Such research would explore the racial bias that other political scientists have discovered in school levy voting and would explore racial differences in teacher shortage data (Tedin, Matland, and Weiher 2001; U.S. Department of Education 1996).

Although the alternative teacher certification area is ripe for more political science research, the area is even riper for more education research. Education leaders need empirical research into whether alternative teacher certification policies place effective teachers in the nation’s classrooms as well as traditional methods of teacher certification place effective teachers in the nation’s classrooms. Such research requires probing not just into the policies themselves, but also requires probing into what makes an effective teacher.
**TABLE 1.**
Summary Statistics and Sources of Variables Used in the Event History Analyses

<table>
<thead>
<tr>
<th>Mechanism or Concept</th>
<th>Explanatory Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable</td>
<td>Passage of alt cert policy</td>
<td>-</td>
<td>-</td>
<td>N=43</td>
<td>N=716</td>
<td>(1)</td>
</tr>
<tr>
<td>Teachers Union</td>
<td>Percentage of teachers belonging to unions</td>
<td>68.38</td>
<td>38.39</td>
<td>0.00</td>
<td>100.00</td>
<td>(2)</td>
</tr>
<tr>
<td>Political Power</td>
<td>Percentage of legislators with K-12 occupation</td>
<td>6.38</td>
<td>3.84</td>
<td>0.00</td>
<td>18.00</td>
<td>(3)</td>
</tr>
<tr>
<td>Diffusion Factors</td>
<td>Time counter (square root)</td>
<td>2.86</td>
<td>1.02</td>
<td>1.00</td>
<td>5.10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of adjacent states with alt cert policies</td>
<td>.86</td>
<td>1.31</td>
<td>0.00</td>
<td>6.00</td>
<td>(1)</td>
</tr>
<tr>
<td></td>
<td>Proportion of adjacent states with alt cert policies</td>
<td>.21</td>
<td>.32</td>
<td>0.00</td>
<td>1.00</td>
<td>(1)</td>
</tr>
<tr>
<td></td>
<td>Number of states in region with alt cert policies</td>
<td>2.28</td>
<td>3.21</td>
<td>0.00</td>
<td>15.00</td>
<td>(1)</td>
</tr>
<tr>
<td></td>
<td>Proportion of states in region with alt cert policies</td>
<td>.20</td>
<td>.28</td>
<td>0.00</td>
<td>1.00</td>
<td>(1)</td>
</tr>
<tr>
<td></td>
<td>Number of states in nation with alt cert policies</td>
<td>10.58</td>
<td>12.76</td>
<td>1.00</td>
<td>44.00</td>
<td>(1)</td>
</tr>
<tr>
<td></td>
<td>Proportion of states in nation with alt cert policies</td>
<td>.21</td>
<td>.26</td>
<td>.02</td>
<td>.88</td>
<td>(1)</td>
</tr>
<tr>
<td>Control Mechanisms</td>
<td>Teacher shortage percentage</td>
<td>1.62</td>
<td>.45</td>
<td>.20</td>
<td>2.50</td>
<td>(4)</td>
</tr>
<tr>
<td>Shortage Conditions</td>
<td>Per pupil spending (in thousands)</td>
<td>4.44</td>
<td>1.32</td>
<td>2.41</td>
<td>12.08</td>
<td>(5)</td>
</tr>
<tr>
<td>Economic Conditions</td>
<td>Legislative professionalism</td>
<td>.24</td>
<td>.12</td>
<td>.04</td>
<td>.87</td>
<td>(6)</td>
</tr>
<tr>
<td>Political Conditions</td>
<td>Divided government</td>
<td>-</td>
<td>-</td>
<td>N=372</td>
<td>N=385</td>
<td>(7)</td>
</tr>
<tr>
<td></td>
<td>Democratic governor</td>
<td>-</td>
<td>-</td>
<td>N=292</td>
<td>N=465</td>
<td>(7)</td>
</tr>
</tbody>
</table>

**TABLE 2.**

**Summary Statistics and Sources of Variables Used in the Policy Strength Analysis**

<table>
<thead>
<tr>
<th>Mechanism or Concept</th>
<th>Explanatory Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
<th>Data Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable</td>
<td>Strength of alt cert policy</td>
<td>8.96</td>
<td>5.02</td>
<td>0.00</td>
<td>18.50</td>
<td>(1), (2)</td>
</tr>
<tr>
<td>Teachers Union Power</td>
<td>Percentage of teachers belonging to unions</td>
<td>68.66</td>
<td>39.41</td>
<td>0.00</td>
<td>100.00</td>
<td>(3)</td>
</tr>
<tr>
<td></td>
<td>Percentage of legislators with K-12 occupation</td>
<td>6.16</td>
<td>3.62</td>
<td>0.00</td>
<td>16.00</td>
<td>(4)</td>
</tr>
<tr>
<td>Control Mechanisms</td>
<td>Teacher shortage percentage</td>
<td>1.49</td>
<td>.46</td>
<td>1.10</td>
<td>2.20</td>
<td>(5)</td>
</tr>
<tr>
<td></td>
<td>Per pupil spending (in thousands)</td>
<td>5.37</td>
<td>1.42</td>
<td>3.04</td>
<td>9.07</td>
<td>(6)</td>
</tr>
<tr>
<td></td>
<td>Legislative professionalism</td>
<td>.26</td>
<td>.14</td>
<td>.05</td>
<td>.89</td>
<td>(7)</td>
</tr>
<tr>
<td></td>
<td>Divided government</td>
<td>-</td>
<td>-</td>
<td>N=20</td>
<td>N=30</td>
<td>(8)</td>
</tr>
<tr>
<td></td>
<td>Democratic governor</td>
<td>-</td>
<td>-</td>
<td>N=21</td>
<td>N=29</td>
<td>(8)</td>
</tr>
<tr>
<td></td>
<td>Legislative delegation to agencies</td>
<td>-</td>
<td>-</td>
<td>N=27</td>
<td>N=23</td>
<td>(1)</td>
</tr>
<tr>
<td></td>
<td>Electoral threat index</td>
<td>.10</td>
<td>.51</td>
<td>0.00</td>
<td>3.00</td>
<td>(9)</td>
</tr>
<tr>
<td>Racial Conditions</td>
<td>Percentage of minority students</td>
<td>23.44</td>
<td>14.53</td>
<td>3.00</td>
<td>58.00</td>
<td>(10)</td>
</tr>
<tr>
<td></td>
<td>Change in percentage of minority students</td>
<td>28.06</td>
<td>17.99</td>
<td>-28.00</td>
<td>98.00</td>
<td>(10)</td>
</tr>
</tbody>
</table>

### Table 3. Event History Model

<table>
<thead>
<tr>
<th>INDEPENDENT VARIABLES</th>
<th>Coefficient</th>
<th>Standard Error (95% Confidence Interval)</th>
<th>Probability of Adoption When All Other Variables Set at Mean Except This Variable Set at Minimum and Maximum (95% Confidence Intervals)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Set at Minimum</td>
<td>Set at Maximum</td>
</tr>
<tr>
<td>Time counter</td>
<td>.787**</td>
<td>(.155)</td>
<td>(.484-.1090)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.0008</td>
<td>(.0000-.0042)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.4507</td>
<td>(.2450-.6658)</td>
</tr>
<tr>
<td>Percentage of teachers belonging to</td>
<td>-.003</td>
<td>(.002)</td>
<td>(-.008-.002)</td>
</tr>
<tr>
<td>unions</td>
<td></td>
<td>.0473</td>
<td>(.0194-.0945)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.0248</td>
<td>(.0117-.0435)</td>
</tr>
<tr>
<td>Percentage of legislators with K-12</td>
<td>-.033</td>
<td>(.024)</td>
<td>(-.079-.013)</td>
</tr>
<tr>
<td>occupation</td>
<td></td>
<td>.0480</td>
<td>(.0196-.0962)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.0144</td>
<td>(.0018-.0440)</td>
</tr>
<tr>
<td>Teacher shortage percentage</td>
<td>.446*</td>
<td>(.203)</td>
<td>(.047-.844)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.0083</td>
<td>(.0007-.0316)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.0681</td>
<td>(.0327-.1204)</td>
</tr>
<tr>
<td>Per pupil spending in thousands</td>
<td>-.032</td>
<td>(.084)</td>
<td>(-.196-.133)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.0361</td>
<td>(.0129-.0742)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.0383</td>
<td>(.0004-.1945)</td>
</tr>
<tr>
<td>Legislative professionalism</td>
<td>1.518*</td>
<td>(.727)</td>
<td>(.094-.943)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.0152</td>
<td>(.0047-.0348)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.1962</td>
<td>(.0355-.4641)</td>
</tr>
<tr>
<td>Divided government</td>
<td>-.231</td>
<td>(.191)</td>
<td>(-.605-.143)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.0390</td>
<td>(.0203-.0658)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.0229</td>
<td>(.0093-.0443)</td>
</tr>
<tr>
<td>Democratic governor</td>
<td>-.135</td>
<td>(.186)</td>
<td>(-.501-.230)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.0366</td>
<td>(.0169-.0676)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.0260</td>
<td>(.0121-.0479)</td>
</tr>
<tr>
<td>Constant</td>
<td>-4.498</td>
<td>(.786)</td>
<td>(-6.039-.2956)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

* p<.05; **p<.01; N = 755; LR Chi² = 46.80; Prob > Chi² = .000; Pseudo R² = .1443; initial log likelihood = -162.15; final log likelihood = .138.74; percent of cases correctly predicted at .057 cutoff (which cutoff is the ratio between adoptions and total cases) = 66%; percent of adoptions correctly predicted at the .057 cutoff = 90%,
TABLE 4.
Policy Strength Model
(All Independent Variables Set to Peak Year of Adoptions-1989)

<table>
<thead>
<tr>
<th>INDEPENDENT VARIABLES</th>
<th>Coefficient</th>
<th>Standard Error (95% Confidence Interval)</th>
<th>Policy Strength When All Other Variables Set at Mean Except This Variable Set at Minimum and Maximum (95% Confidence Interval)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Set at Minimum</td>
</tr>
<tr>
<td>Percentage of teachers belonging to unions</td>
<td>-.053*</td>
<td>(.025) (-.103--.002)</td>
<td>12.57 (9.06-16.03)</td>
</tr>
<tr>
<td>Percentage of legislators with K-12 occupation</td>
<td>.096</td>
<td>(.198) (-.305-.497)</td>
<td>8.33 (5.70-10.85)</td>
</tr>
<tr>
<td>Teacher shortage percentage</td>
<td>.121</td>
<td>(.1797) (-3.517-3.760)</td>
<td>8.89 (7.16-10.60)</td>
</tr>
<tr>
<td>Per pupil spending in thousands</td>
<td>.636</td>
<td>(.667) (-.714-1.987)</td>
<td>7.51 (4.02-10.91)</td>
</tr>
<tr>
<td>Legislative professionalism</td>
<td>14.104*</td>
<td>(6.131) (1.693-26.515)</td>
<td>6.01 (3.12-8.81)</td>
</tr>
<tr>
<td>Divided government</td>
<td>-2.394</td>
<td>(1.570) (-5.572-.783)</td>
<td>10.39 (8.21-12.50)</td>
</tr>
<tr>
<td>Legislative or agency policy</td>
<td>0.069</td>
<td>(1.517) (-3.139-3.001)</td>
<td>8.99 (7.11-10.88)</td>
</tr>
<tr>
<td>Minority percentage</td>
<td>.038</td>
<td>(.062) (-.087-.164)</td>
<td>8.16 (5.49-10.79)</td>
</tr>
<tr>
<td>Electoral threat</td>
<td>.695</td>
<td>(1.467) (-2.274-3.664)</td>
<td>8.90 (7.74-10.06)</td>
</tr>
<tr>
<td>Change in minority percent</td>
<td>.023</td>
<td>(.042) (-.061-.107)</td>
<td>7.67 (2.74-12.29)</td>
</tr>
<tr>
<td>Democratic governor</td>
<td>.435</td>
<td>(1.526) (-2.655-3.524)</td>
<td>8.71 (6.40-10.83)</td>
</tr>
<tr>
<td>Constant</td>
<td>4.285</td>
<td>(4.214) (-4.247-12.816)</td>
<td>-</td>
</tr>
</tbody>
</table>

* p<.05; N = 50; Prob > F = .053; R² = .3696; Adjusted R² =.1871; percentage of cases correctly predicted at using mean residual (3.1713) as cut point = 54%.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>.1402</td>
<td>.1686</td>
<td>.1528</td>
<td>.1355</td>
<td>.1168</td>
<td>.0970</td>
<td>.0772</td>
<td>.0589</td>
</tr>
<tr>
<td></td>
<td>N 761</td>
<td>N 714</td>
<td>N 666</td>
<td>N 618</td>
<td>N 570</td>
<td>N 522</td>
<td>N 474</td>
<td>N 426</td>
</tr>
<tr>
<td>2000</td>
<td>.1443</td>
<td>.1759</td>
<td>.1601</td>
<td>.1428</td>
<td>.1240</td>
<td>.1040</td>
<td>.0841</td>
<td>.0664</td>
</tr>
<tr>
<td></td>
<td>N 755</td>
<td>N 708</td>
<td>N 660</td>
<td>N 612</td>
<td>N 564</td>
<td>N 516</td>
<td>N 468</td>
<td>N 420</td>
</tr>
<tr>
<td>1999</td>
<td>.1497</td>
<td>.1832</td>
<td>.1674</td>
<td>.1499</td>
<td>.1307</td>
<td>.1101</td>
<td>.0891</td>
<td>.0698</td>
</tr>
<tr>
<td></td>
<td>N 749</td>
<td>N 702</td>
<td>N 654</td>
<td>N 606</td>
<td>N 558</td>
<td>N 510</td>
<td>N 462</td>
<td>N 414</td>
</tr>
<tr>
<td>1998</td>
<td>.1552</td>
<td>.1904</td>
<td>.1745</td>
<td>.1569</td>
<td>.1374</td>
<td>.1162</td>
<td>.0942</td>
<td>.0734</td>
</tr>
<tr>
<td></td>
<td>N 743</td>
<td>N 696</td>
<td>N 648</td>
<td>N 600</td>
<td>N 552</td>
<td>N 504</td>
<td>N 456</td>
<td>N 408</td>
</tr>
<tr>
<td>1997</td>
<td>.1521</td>
<td>.1875</td>
<td>.1714</td>
<td>.1535</td>
<td>.1337</td>
<td>.1121</td>
<td>.0894</td>
<td>.0678</td>
</tr>
<tr>
<td></td>
<td>N 736</td>
<td>N 689</td>
<td>N 641</td>
<td>N 593</td>
<td>N 545</td>
<td>N 497</td>
<td>N 449</td>
<td>N 401</td>
</tr>
<tr>
<td></td>
<td>N 729</td>
<td>N 682</td>
<td>N 634</td>
<td>N 586</td>
<td>N 538</td>
<td>N 490</td>
<td>N 442</td>
<td>N 394</td>
</tr>
<tr>
<td>1995</td>
<td>.1680</td>
<td>.2092</td>
<td>.1931</td>
<td>.1750</td>
<td>.1546</td>
<td>.1319</td>
<td>.1073</td>
<td>.0823</td>
</tr>
<tr>
<td></td>
<td>N 722</td>
<td>N 675</td>
<td>N 641</td>
<td>N 579</td>
<td>N 531</td>
<td>N 483</td>
<td>N 435</td>
<td>N 387</td>
</tr>
<tr>
<td>1994</td>
<td>.1757</td>
<td>.2195</td>
<td>.2033</td>
<td>.1851</td>
<td>.1645</td>
<td>.1414</td>
<td>.1160</td>
<td>.0896</td>
</tr>
<tr>
<td></td>
<td>N 715</td>
<td>N 668</td>
<td>N 620</td>
<td>N 572</td>
<td>N 524</td>
<td>N 476</td>
<td>N 428</td>
<td>N 380</td>
</tr>
<tr>
<td>1993</td>
<td>.1813</td>
<td>.2280</td>
<td>.2118</td>
<td>.1936</td>
<td>.1729</td>
<td>.1494</td>
<td>.1235</td>
<td>.0963</td>
</tr>
<tr>
<td></td>
<td>N 706</td>
<td>N 659</td>
<td>N 611</td>
<td>N 563</td>
<td>N 515</td>
<td>N 467</td>
<td>N 419</td>
<td>N 371</td>
</tr>
<tr>
<td></td>
<td>N 696</td>
<td>N 649</td>
<td>N 601</td>
<td>N 553</td>
<td>N 505</td>
<td>N 457</td>
<td>N 409</td>
<td>N 361</td>
</tr>
<tr>
<td></td>
<td>N 685</td>
<td>N 638</td>
<td>N 590</td>
<td>N 542</td>
<td>N 494</td>
<td>N 446</td>
<td>N 398</td>
<td>N 350</td>
</tr>
<tr>
<td>1990</td>
<td>.1715</td>
<td>.2260</td>
<td>.2097</td>
<td>.1913</td>
<td>.1704</td>
<td>.1468</td>
<td>.1214</td>
<td>.0962</td>
</tr>
<tr>
<td></td>
<td>N 667</td>
<td>N 620</td>
<td>N 572</td>
<td>N 524</td>
<td>N 476</td>
<td>N 428</td>
<td>N 380</td>
<td>N 332</td>
</tr>
</tbody>
</table>

Note: Stata® code used: probit depvar prpup legprof divgovt govdem legocc pctunion shortpct timesqrt if yrsatrsk==1 & [various year restrictions (beginning years 1975-1982, ending years 1990-2001)]
<table>
<thead>
<tr>
<th>STATE</th>
<th>YEAR</th>
<th>STRENGTH</th>
<th>STATE</th>
<th>YEAR</th>
<th>STRENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>1991</td>
<td>9.25</td>
<td>Montana</td>
<td>1975</td>
<td>0.00</td>
</tr>
<tr>
<td>Alaska</td>
<td>1994</td>
<td>9.25</td>
<td>Nebraska</td>
<td>None</td>
<td>0.00</td>
</tr>
<tr>
<td>Arizona</td>
<td>1988</td>
<td>7.75</td>
<td>Nevada</td>
<td>1996</td>
<td>4.00</td>
</tr>
<tr>
<td>Arkansas</td>
<td>1988</td>
<td>6.75</td>
<td>New Hampshire</td>
<td>1989</td>
<td>14.00</td>
</tr>
<tr>
<td>California</td>
<td>1983</td>
<td>15.50</td>
<td>New Jersey</td>
<td>1984</td>
<td>14.00</td>
</tr>
<tr>
<td>Colorado</td>
<td>1991</td>
<td>12.50</td>
<td>New Mexico</td>
<td>1986</td>
<td>9.25</td>
</tr>
<tr>
<td>Connecticut</td>
<td>1986</td>
<td>10.75</td>
<td>New York</td>
<td>1966</td>
<td>12.00</td>
</tr>
<tr>
<td>Delaware</td>
<td>1986</td>
<td>10.75</td>
<td>North Carolina</td>
<td>1985</td>
<td>12.25</td>
</tr>
<tr>
<td>Florida</td>
<td>1988</td>
<td>12.25</td>
<td>North Dakota</td>
<td>None</td>
<td>0.00</td>
</tr>
<tr>
<td>Georgia</td>
<td>1989</td>
<td>15.50</td>
<td>Ohio</td>
<td>1989</td>
<td>9.25</td>
</tr>
<tr>
<td>Hawaii</td>
<td>1991</td>
<td>3.50</td>
<td>Oklahoma</td>
<td>1990</td>
<td>10.00</td>
</tr>
<tr>
<td>Idaho</td>
<td>1990</td>
<td>7.75</td>
<td>Oregon</td>
<td>1986</td>
<td>9.25</td>
</tr>
<tr>
<td>Illinois</td>
<td>1990</td>
<td>9.00</td>
<td>Pennsylvania</td>
<td>1983</td>
<td>11.25</td>
</tr>
<tr>
<td>Indiana</td>
<td>None</td>
<td>0.00</td>
<td>Rhode Island</td>
<td>2001</td>
<td>0.75</td>
</tr>
<tr>
<td>Iowa</td>
<td>None</td>
<td>3.00</td>
<td>South Carolina</td>
<td>1984</td>
<td>9.25</td>
</tr>
<tr>
<td>Kansas</td>
<td>1992</td>
<td>4.50</td>
<td>South Dakota</td>
<td>1985</td>
<td>3.00</td>
</tr>
<tr>
<td>Kentucky</td>
<td>1984</td>
<td>15.50</td>
<td>Tennessee</td>
<td>1984</td>
<td>6.00</td>
</tr>
<tr>
<td>Louisiana</td>
<td>1990</td>
<td>4.25</td>
<td>Texas</td>
<td>1985</td>
<td>15.50</td>
</tr>
<tr>
<td>Maine</td>
<td>None</td>
<td>6.00</td>
<td>Utah</td>
<td>1991</td>
<td>7.75</td>
</tr>
<tr>
<td>Maryland</td>
<td>1990</td>
<td>16.25</td>
<td>Vermont</td>
<td>1982</td>
<td>3.75</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>1982</td>
<td>12.25</td>
<td>Virginia</td>
<td>1998</td>
<td>14.75</td>
</tr>
<tr>
<td>Michigan</td>
<td>1993</td>
<td>17.00</td>
<td>Washington</td>
<td>1989</td>
<td>14.00</td>
</tr>
<tr>
<td>Minnesota</td>
<td>1993</td>
<td>9.25</td>
<td>West Virginia</td>
<td>1991</td>
<td>18.50</td>
</tr>
<tr>
<td>Mississippi</td>
<td>1986</td>
<td>12.25</td>
<td>Wisconsin</td>
<td>1991</td>
<td>3.00</td>
</tr>
<tr>
<td>Missouri</td>
<td>1989</td>
<td>10.75</td>
<td>Wyoming</td>
<td>1990</td>
<td>4.75</td>
</tr>
</tbody>
</table>
**TABLE 7.**
Difference of Means Tests on Policy Strength Variable (Dividing States Based on Legislative vs. Administrative Enactment Dummy Variable)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Min/Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entire Dataset</td>
<td>43</td>
<td>9.81</td>
<td>5.62</td>
<td>0/18.5</td>
</tr>
<tr>
<td>Legislative Enactment</td>
<td>16</td>
<td>11.03</td>
<td>4.33</td>
<td>0/18.5</td>
</tr>
<tr>
<td>Administrative Enactment</td>
<td>27</td>
<td>9.09</td>
<td>4.71</td>
<td>0/17</td>
</tr>
</tbody>
</table>

Difference of Means Test Results: Ha: diff>0 t=1.34 P> t =.09
Interpretive note: Legislative enactments tend to be stronger than administrative enactments, but the difference of means test is significant only at the .10 level.

**TABLE 8.**
Difference of Means Test on Legislative vs. Administrative Dummy Variable (Dividing Dataset Based on Strong vs. Weak Policy Variable)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Min/Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entire Dataset</td>
<td>43</td>
<td>.37</td>
<td>.49</td>
<td>0/1</td>
</tr>
<tr>
<td>Strong Policy</td>
<td>29</td>
<td>.48</td>
<td>.51</td>
<td>0/1</td>
</tr>
<tr>
<td>Weak Policy</td>
<td>14</td>
<td>.14</td>
<td>.36</td>
<td>0/1</td>
</tr>
</tbody>
</table>

Difference of Means Test Results: Ha: diff<0 t=-2.23 P> t =.0155
Interpretive notes:
1. Weak alternative teacher certification policies are more likely to have come from administrative enactments than legislative enactments.
2. Strong alternative teacher certification policies have almost a 50/50 chance of having come from either the legislature or an administrative agency.
TABLE 9. Running Separate Event History Models (Dividing Dataset by Strength of the Policy (Strong or Weak))

| Model with All Observations | 755 | 1443 | .0000 | Legislative professionalism: 1.51 (.73) Teacher shortage percentage: .45 (.20) Time counter: .79 (.15) |
| Model with Observations from States with Strong Alternative Teacher Certification Policies | 404 | .2767 | .0000 | Time counter: 1.53 (.38) |
| Model with Observations from States with Weak Alternative Teacher Certification Policies | 351 | .1091 | .1454 | Teacher shortage percentage: .58 (.32) Time counter: .50 (.20) |

Interpretive notes:
1. The time counter variable has a larger coefficient in the model with strong alternative certification policies. This might mean that stronger alternative certification policies became more prevalent with the passage of time.
2. The teacher shortage percentage variable has a larger coefficient in the model with weak alternative certification policies. We might expect this result if we consider that the weakest alternative certification policies often serve as stop-gap measures.
### TABLE 10.
Running Separate Event History Models
(Dividing Dataset by Type of Enactment (Legislative or Administrative))

<table>
<thead>
<tr>
<th>Model Description</th>
<th>N</th>
<th>Pseudo $R^2$</th>
<th>Prob $&gt;\text{Chi}^2$</th>
<th>Significant Variables &amp; Their Coefficients and Standard Errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model with All Observations</td>
<td>755</td>
<td>.1443</td>
<td>.0000</td>
<td>Legislative professionalism: 1.52 (.73)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Teacher shortage percentage: .45 (.20)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Time counter: .79 (.15)</td>
</tr>
<tr>
<td>Model with All Observations with a Value for the Legislative or Administrative Dummy Variable</td>
<td>599</td>
<td>.2084</td>
<td>.0000</td>
<td>Time counter: .97 (.18)</td>
</tr>
<tr>
<td>Model with States Whose Legislature Enacted the Alternative Teacher Certification Policy</td>
<td>197</td>
<td>.2444</td>
<td>.0007</td>
<td>Time counter: .70 (.29)</td>
</tr>
<tr>
<td>Model with States Whose Administrative Agency Enacted the Alternative Teacher Certification Policy</td>
<td>402</td>
<td>.2556</td>
<td>.0000</td>
<td>Time counter: 1.32 (.30)</td>
</tr>
</tbody>
</table>

Interpretive notes:
1. The model with all observations with a value for the legislative or administrative dummy variable performs better than the model with all observations. This might be because the former model excludes observations from all right-censored states, which are the states that did not pass alternative teacher certification policies before or during the 1975-2000 time period of the event history analysis.
2. These four models, which do not account for the strength of the alternative certification policies in either the left hand or the right hand side of the equation, give us little statistically significant information.
REFERENCES


No Child Left Behind Act, Troops to Teachers Program. 2002. United States Code, Title 30, Chapter 70, Subchapter II, Part C, Subpart 1, Division A.

No Child Left Behind Act, Transitions to Teaching Program. 2002. United States Code, Title 30, Chapter 70, Subchapter II, Part C, Subpart 1, Division B.


