UNIVERSITY OF CALIFORNIA, SAN DIEGO

Strategy, Choice and the Pathways to Power:

Sequence Analysis of Political Careers

A dissertation submitted in partial satisfaction of the

requirements for the degree Doctor of Philosophy

in

Political Science

by

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Chair

University of California, San Diego

2009

DEDICATION

To

Cheryl

for love, laughter, and inspiration,

past, present, and future

To

Mom and Dad

for encouraging big dreams and

the sacrifices you made in

helping them come true

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ACKNOWLEDGEMENTS

Does who they are and how they got to be there influence what politicians do? This basic question, which has engaged several generations of scholars, was the starting point for this dissertation. The Framers believed that political institutions could be designed to increase the probability of selecting individuals of good character and experience to serve in public office. Empirical research on political careers has proceeded under a similar presumption – that the backgrounds of politicians and the paths they follow to public office will inform studies of political behavior and institutional development. Unfortunately, past work has failed to conclusively demonstrate this link.

The results reported in this dissertation indicate that, when measured appropriately, previous political experience does influence behavior in office. Demonstrating this link, however, requires both new data and new methods. New data are required because existing sources typically lack sufficient information on the number, type and order of offices occupied by politicians. New methods are needed because traditional statistical techniques are ill-equipped to handle complex career sequences. Over the past three years, I have spent many hours compiling new data, learning new methods and assembling the chapters for this project. Fortunately, I received a great deal of help along the way.

The original prospectus for this project was overly broad and unfocused. My advisor, Samuel Kernell, was patient as I fumbled around for an action plan and tried to prevent this dissertation from "sprouting like a MacKenzie potato." Sam contributed some of the data used in this dissertation. The modeling strategies followed in several of

the empirical chapters build on his published and unpublished work. Sam is the co-author of the material in Chapter 7, which studies the effects of previous political experience on the behavior of members of the U.S. House of Representatives.

I owe a substantial debt to those who contributed to my intellectual development and practical training at UCSD. In particular, I would like to thank the five members of my dissertation committee – Samuel Kernell (Chair), Kate Antonovics, Steven P. Erie, Keith T. Poole and Matthew Soberg Shugart. Kate Antonovics enthusiastically joined this project in its nascent stages and patiently pointed out several theoretical and methodological shortcomings in its original research design. Matthew Shugart provided excellent feedback on chapter drafts, including the literature review in Chapter 2. He has also prodded me to think more deeply about the relationship between careers and institutions, and to explore the potential these methods have for comparative analysis.

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Over the past six years, Steven P. Erie has been both a mentor and friend. He gave me my first introduction to the interdisciplinary community of urban scholars and policy-makers in Southern California and across the country. He supplemented my statistical training with opportunities to do field work in complex urban settings. When

my departmental funding dried up in my final year at UCSD, Steve went out of his way to find me a placement in the Urban Studies Program and History Department. When my progress was less than satisfactory, he challenged me to do better. Finally, Steve invited me to work with him on several papers and a book project on San Diego politics, helping to build up my CV and allowing me to pursue my interests in urban politics.

Samuel Kernell took an interest in me during my first year of graduate school. He got me started doing empirical research by sharing some data on the historical development of the U.S. Post Office Department. I worked closely with Sam for four years on many different projects, honing my skills in data analysis and the use of various statistical packages. Sam gave me an opportunity to join my love of American history with the study of politics and political institutions. He has shaped the way that I think about politics and my understanding of what it means to be a working political scientist. He patiently read drafts of each chapter in this dissertation and helped shepherd me to completion. I fear that I will never be able to fully repay Sam for his teachings, patience, friendship and personal investment in my success.

I also could not have gotten to where I am today without the support of good friends and my family. My mom, Michele, taught me the value of hard work and never allowed my self-belief to lapse. If I had half of her energy, this dissertation would have been finished long ago. My dad, Gary, worked hard to give me every opportunity to pursue my dreams. My sister, Jacqui, brother, Jason, and two nephews, Tyler and Avery, never let me forget that life comes before the study of politics. My best friend Mike and his parents have always been like a second family to me. Several friends and colleagues

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Note: The empirical chapters in this dissertation were initially prepared as stand alone papers. Thus, some of the material in the data and coding, and methods sections of these chapters repeats parts of the lengthier methodological discussion in Chapter 3.

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ABSTRACT OF THE DISSERTATION

Strategy, Choice and the Pathways to Power:

Sequence Analysis of Political Careers

by

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Professor Samuel Kernell, Chair

Past work on political careers assumes that who politicians are and how they got to be there will influence what they do. Unfortunately, several decades of empirical research have failed to conclusively link differences in previous political experience to the choices that politicians make. In this dissertation, I argue that previous experience matters. Empirically demonstrating this, however, requires both new data and new

methods. New data are needed because existing resources do not allow researchers to recover the sequence of offices held by politicians before they reach institutions like the U.S. House of Representatives. New methods are needed because traditional measures of experience fail to capture differences among career sequences.

To address deficiencies in data collection, I collected complete career sequences for 5,983 politicians who held the office of U.S. cabinet member, senator, representative, federal judge, state governor or big city mayor between 1809 and 1944. For each individual, all stints in public service were recorded, coded and assembled as sequences of office-holding events. To make sense of complex career sequences, I used an optimal matching algorithm used by molecular biologists to compare protein and DNA sequences. This algorithm was used to calculate a distance measure that summarizes differences in the number, type and order of offices occupied. I then used cluster analysis to group similar sequences together into meaningful career paths. Finally, these groups, or paths, were used as independent and dependent variables in statistical analyses.

The application of these new methods to more comprehensive career data yielded several substantive findings. I find, for example, that political professionalization was pervasive in the U.S. during the late 19th and early 20th centuries. Features of professionalization included longer terms of service within the six offices studied here and increasing specialization in the career paths to these offices. Rather than reflect a random walk, I show that the pathways to power are shaped by political institutions. Finally, I find that previous political experience helps explain behavior in office, including the reelection experiences and retirement decisions of big city mayors and members of the U.S. House.

Chapter 1

Taking Sequences Seriously:
An Argument for New Data and Methods in Political Career Studies

Who serves in public office? How did they get there? These are questions that have engaged researchers for generations. To address them, historians, political scientists and others have compiled detailed information on the careers of public servants. Scholarly efforts range from full-length biographies that analyze the psychology or social environments of individual politicians to large-*N* datasets like *The Roster of U.S. Congressional Officeholders* (McKibbin 1997). The latter offers more than 100 variables on over 11,000 individuals who served in the U.S. Congress from 1789 to 1996. Biographical directories have been published with information about the personal characteristics and employment histories of tens of thousands of politicians serving in a variety of elected and appointed offices. While not always well-organized for the purposes of statistical analysis, these resources offer a wealth of data to students of political careers.

Why study political careers? Among political scientists, the answer to this question is considered to be self-evident. Constitutions in the U.S. and other countries delegate control of the government to a few individuals. Information about the backgrounds and experiences of public servants allow researchers to assess whether those in government represent, both descriptively and substantively, those in whose name they act. The Framers believed that institutions could be designed to increase the likelihood of recruiting men of ability to serve in government. In *Federalist* 10, for example, Madison

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argued that free elections in a large republic would result in the selection of those who possess "the most attractive merit" and "most diffusive and established characters" for public office (Rossiter 1961). Selection of more qualified candidates for public office would result in better decision-making.

Though less sanguine than the *Federalist* about the salutary effects of wealth and privilege, those who study political careers have proceeded under a similar presumption – i.e., that information on the backgrounds and experiences of public officials can help explain political behavior and institutional development. Unfortunately, several decades of empirical research have failed to conclusively link differences in the path to office to the choices politicians make while there. While political scientists have learned much about who serves in public office, it is unclear whether differences in background or experience make any difference at all. Indeed, reflecting upon the state of research on legislative recruitment – the most developed area of careers studies by far – one scholar concluded:

> Knowledge about who legislators are and how they got to be there should contribute to a better understanding of legislative behavior and institutions. Yet after several decades of unprecedented achievement in legislative research, this linkage is still mainly an assertion (Matthews 1984, p. 574).

In the intervening years, nothing has happened to significantly alter this pessimistic assessment.

In this dissertation, I take up this empirical challenge. Like many who study political careers, I argue that who politicians are and how they reach public office matters. Empirically demonstrating this link, however, requires an approach that deviates from the ways that political careers are typically studied. This alternative approach

requires new perspectives, more comprehensive data and statistical methods that are less familiar to political scientists. New perspectives are needed because the dominant framework in career studies, which assumes that political careers are well-represented by a first-order Markov process, is theoretically questionable and ignores information contained in past decisions. More comprehensive data must be collected because existing resources, like *The Roster*, do not allow researchers to recover the sequence of offices held by politicians before they reach particular offices. Finally, new methods are needed because traditional statistical techniques are ill-suited for making direct comparisons among career sequences.

In the rest of this chapter, I sketch out this argument more explicitly. The next section briefly describes existing approaches to studying political careers. The third section discusses the first-order Markov assumptions that are embedded in many individual-level models of career decision-making and their implications. The fourth section summarizes the advantages and disadvantages of sequence analysis methods as an alternative approach for studying careers. The final section concludes with a discussion of the potential contribution that sequence analysis methods can make in career studies and political science more generally.

1. Traditional Approaches to Studying Political Careers

Those who study political careers have long recognized the difficulties of defining the political career and identifying career paths (Wahlke et al. 1962). Political careers are less predictable than other types of careers. There are many routes to public office and no two careers will be exactly alike. Much of the variation in career paths is encoded in

complex office-holding sequences that are difficult to conceptualize theoretically and, until recently, nearly impossible to analyze empirically. Nonetheless, researchers have made ample progress in uncovering important trends in the career patterns of different politicians and linking these trends to both individual characteristics and political institutions.

Past studies of political careers can be usefully grouped into four main categories:

1.1 Recruitment

Recruitment studies attempt to explain why individuals become candidates for public office (for a detailed review, see Matthews 1984; Fowler 1993). Scholars have focused their attention on several explanatory variables, including personality (Lasswell 1930, 1948; Barber 1965), social background (Matthews 1954; Wahlke et al. 1962), personal goals (Payne & Woshinsky 1972), office goals (Schlesinger 1966; Black 1972) and political processes (Key 1949; Prewitt 1970; Jacobson & Kernell 1981). More recent work assesses the importance of these factors in recruitment to various offices (Maisel & Stone 1997), with particular attention paid to women (Darcy, Welch & Clark 1994) and minority candidates (Cole 1976; Cavanagh & Stockton 1983). Recruitment studies have employed a variety of methods, including biography, personal interviews, survey experiments, case studies and large-*N* statistical analyses. Attempts to link recruitment to behavior in office, however, have borne little fruit (Matthews 1984).

1.2 Institutionalization

Many scholars have analyzed political careers at the aggregate level or used individual-level data to explain aggregate trends. These studies have yielded much descriptive information about career patterns over time. Polsby's (1968) application of institutionalization (Eisenstadt 1964; Huntington 1965) to the U.S. House remains the seminal work in this field. The startling increase in congressional careerism in the first half of the 20th century is among the most oft-cited trends in political science. Subsequent work attempts to identify the causes of careerism, focusing on changes in internal organization (Polsby, Gallaher & Rundquist 1969), economic development (Wiebe 1967), party competition (Price 1971, 1975, 1977), job satisfaction (Hibbing 1981), and electoral system institutions (Katz & Sala 1996). More recent work has attended to the problem of professionalization, whether measured at the level of the individual (King 1981) or institutions (Squire 1988, 1992). Nonetheless, while progress in this area has been substantial, the timing of institutionalization and its relationship to institutional development require further study (Hibbing 1999).

1.3 Individual-level Models of Reelection and Retirement

Since the early 1990s, individual-level models of career-decision making have constituted the dominant approach in career studies. These models separate the office-holding sequences that form a political career into a series of choices made at regular decision points. The choice facing the individual at each decision point is whether to run for reelection, retire or seek another office. These studies focus narrowly on careers within institutions (e.g., the U.S. House), ignoring choices made elsewhere. Each choice

is treated as an independent observation and previous political experience is ignored. What distinguishes these models is whether individuals contribute one (Groseclose & Krehbiel 1994) or multiple observations (Kiewiet & Zeng 1993) to the analysis. Individual-level models have demonstrated how the electoral setting (Kiewiet & Zeng 1993), electoral system institutions (Kernell 2003), redistricting (Groseclose & Krehbiel 1994), personal scandal (Jones 1994), golden parachutes (Hall & Van Houweling 1995) and job satisfaction (Theriault 1998) shape the retirement decision.

1.4 Political Ambition

Studies of political ambition seek to identify the different paths to public offices and model the decision to seek higher office (see Prinz 1993 for a review). Schlesinger (1966) attempted to map out the career paths of governors and senators, and related differences among political career patterns to state opportunity structures. It continues to be the classic study in the field. More recent work attempts to model the decision to move from one office to another. Scholars have studied transitions from the state legislature to the U.S. House (Berkman 1994), from the House to governor (Rohde 1979), the U.S. Senate (Francis & Kenny 1993) and federal bureaucracy (Palmer & Vogel 1995), and from the Senate to the White House (Abramson et al. 1987). These studies typically assume that all politicians harbor progressive ambitions (Maestas et al. 2006) and model the decision to seek higher office as a function of electoral prospects, the benefits of higher office and the costs of running.

2. The Markovian Assumptions of Individual-Level Models

In the last 20 years, the trend in career studies has been to move away from aggregate-level analyses in favor of individual-level models of career decision-making. Researchers have lost interest in aggregate career patterns and focused instead on modeling the underlying probabilistic process that presumably gives rise to them. Hall & Van Houweling (1995) justify this shift in stating that the individual choice process must be understood if scholars are to fully comprehend the changing patterns in aggregate-level time series. This argument might be true in the abstract, but implicitly presumes that the individual choice process can be modeled without regard to aggregate career patterns. Indeed, an extreme version of this view holds that the sequences of office-holding events that comprise careers are an irrelevant by-product of the stochastic process that generates decision-making outcomes in a stepwise fashion.

Most individual-level models proceed under the *as if* assumption that career sequences are artifacts of the individual choice process. The likelihood of running for reelection, retiring or seeking another office is modeled as a function of exogenous variables and, if an event history setup is used, time elapsed since a prior event. Which exogenous variables are important? Initially, researchers (see Bogue et al. 1976) focused on individual characteristics – age, race, education, occupation, and family connections. Schlesinger (1966), Rohde (1979) and others, however, have identified a variety of structural determinants – open seats, electoral system institutions, redistricting, and national conditions. Still others (Bullock 1972) argue for the primacy of internal organization – pension rules, campaign finance regulations, job satisfaction, and

committee portfolios. Finally, those using event history models have incorporated different specifications of duration dependency (Jones 1994).

These models have obvious advantages. First, focusing on choices made at particular moments in time sidesteps the difficulty of accounting for the apparent irregularities among career sequences. While sequences leading to particular offices often appear disorderly, the systematic component of the individual choice process can be described by estimating the effects of the variables described above. Moreover, if the data generating process governing the choice process is stepwise, one can safely ignore the irregular sequences leading up to particular decision points. Second, modeling careers as a series of independent choices enables the researcher to tap methods – e.g., maximum likelihood and event history analysis – that are familiar to political scientists. Until recently, methods for directly comparing career sequences either did not exist or were computationally cumbersome to implement. Third, individual-level choice models allow the researcher to focus on the effects of individual characteristics, structural conditions and internal organization. Many political scientists are more interested in these variables than political careers per se.

These advantages, however, are purchased at some cost. Individual-level models require researchers to assume that all choices – whether made by different individuals at the same decision point or by the same individual at different decisions points – are independent from each other. Moreover, the underlying stochastic process governing individual choices must be identically distributed over time. Controlling for exogenous factors, it must be true, for example, that members of the House are no more likely to retire in 1906 as 2006. Similarly, a member is as likely to seek another office at the first

as at the twenty-first decision point. Finally, most individual-level models assume the absence of autocorrelation (a corollary of the independence assumption). There can be no cumulative effect of past choices. Thus, the path followed by the individual to a given decision point must be irrelevant.

Despite Hall & Van Houweling's (1995) claim that the choice process can be studied in isolation, the assumptions embedded in individual-level models have implications for aggregate-level career patterns. Modeling the political career as a series of disconnected choices effectively assumes that political mobility – defined here as the pattern of transitions within and between public offices – is well-represented by a first-order Markov process. Markov models typically make three critical assumptions about mobility (Bartos 1967). The first presumes that a substantial degree of homogeneity exists within different states (e.g., among federal judges). This assumption is rarely problematic and, if necessary, can be relaxed. Indeed, modeling individual heterogeneity in the probability of staying or moving is precisely the purpose of most individual-level models of ambition.

The second assumption, path independence, is more controversial. According to the path independence assumption, the position of an officeholder at time *t* is a function of the position held at *t-1* and the transition probability matrix – a complete listing of the baseline probabilities of moving between pairs of offices. The latter can be estimated from empirical data on the movement of individuals between offices. Information prior to *t-1* is irrelevant. Thus, such models stipulate that previous political experience does not matter. The third assumption, stationarity, is equally problematic. It requires that the transition probabilities remain constant over time. Markov models can be easily

estimated from sequence data and used to predict an expected number of transitions between offices and a likely termination state.

How realistic are the assumptions embedded in individual-level models? With respect to political careers, they are not realistic at all. One problem stems from the longitudinal character of career data. As Jones (1994) points out, choices made by a single individual over time are related. Whether an individual decides to run for reelection at time *t* depends on having run (and won) at *t-1*. Another source of unreality is the presumption that the sequence generating process is Markovian. Unfortunately, the foundational assumption of path independence is difficult to defend. An individual who reaches the Senate after serving as governor, for example, is less likely to resign and run for governor than a senator lacking gubernatorial service. Thus, choices made prior to *t* can circumscribe the options available at *t+1*. Even less defensible is the stationarity assumption. For a variety of reasons, politicians are much less likely to leave the U.S. House for state legislative positions than they were in the 19th century, when such transitions were frequent. The transition probability matrix, which summarizes the pairwise propensities of moving between offices, has changed considerably over the course of history.

Aside from the deficiencies of these Markovian assumptions, there are several affirmative reasons for paying attention to the sequential component of political careers. One reason is that the researcher's interest might extend beyond the House career or discrete transitions between two offices. Incorporating sequences facilitates examination of a whole range of office-holding events. Methods that rely on a stochastic conceptualization of political careers have difficulty incorporating multiple events.

Another reason is that the politicians of interest in individual-level models might conceive of their careers as coherent sequences rather than a series of disconnected decisions. Most individual-level models of ambition assume that all individuals harbor progressive ambition. It is possible, however, that individuals have preconceived notions about what career paths are possible or appropriate (Abbott & Hrycak 1990). They model their careers on these notions and their decisions at any decision point anticipate later courses of action. Within the U.S. House, for example, a member might expect to begin at the bottom of the committee food chain, work her way up to a committee chairmanship and parlay seniority into policy benefits. Such an expectation would make little sense for those serving in the House of Commons, where committees are less influential. Whatever the case, how a politician envisions the ideal typical career will influence choices at each decision point.

Perhaps the most compelling reason for attending to the sequential aspects of political careers is to improve understanding of the systematic component of career decision-making. The data generating process that produces career sequences need not be Markovian for it to be stochastic. In lieu of representing career sequences as memory-less phenomena, researchers can incorporate the information contained in early decisions to explain choices made later on. In order to do so, however, the researcher must identify some method of organizing sequential information into categories that will be useful for traditional statistical analysis. Event history and ARIMA models are designed to incorporate the effects of the past, but are ill-suited to the task of organizing complex career sequences into recognizable categories. With respect to political careers, it is

necessary to take what appear to be irregular sequences of office-holding events and group them into categories that are theoretically meaningful.

3. Taking Sequential Information Seriously

The problem of organizing complex sequences of office-holding events into meaningful categories or career paths can be overcome using sequence analysis methods. Sequence analysis refers to a body of methods that take whole sequences as units of analysis, rather than treating each event as an individual data point. In this way, sequence analysis differs from time series methods that treat sequences as by-products of a stochastic process that generates events, e.g., career decisions, step-by-step. Stepwise approaches, including first-order Markov and event history models, have been the standard methods applied to sequential data in the social sciences (see Abbott 1995). These methods, however, require assumptions about the relationship between adjacent events, and usually ignore information about the ordering of events.

Sequence analysis proceeds in four steps. In the first step, data describing sequences of events, in this case a series of office-holding events, are coded and formatted for analysis. In the second step, an optimal matching (OM) algorithm is used to calculate a distance measure between sequences of events. In the third step, exploratory techniques, such as cluster analysis and multi-dimensional scaling, are used to group similar sequences together and analyze the matrix of distances produced by the algorithm. Finally, these groups of sequences are used as independent or dependent variables in statistical analyses. Steps 1, 3 and 4 are familiar to most political scientists.

The optimal matching algorithm described in Step 2, however, is relatively new in political science and, as such, requires further explanation.

Optimal matching is a dynamic programming technique that solves the problem of measuring resemblances between sequences. OM was first developed by molecular biologists interested in comparing protein and DNA sequences. Computer algorithms for assessing sequence resemblances were invented in the 1970s (Macindoe & Abbott 2004); by the early 1980s, OM techniques had spread to a variety of applications, including molecular biology, speech recognition and computer science (Kruskal 1983). In the 1990s, social scientists began using optimal matching to examine complex sequences of events, including careers. Abbott and Hrycak (1990), for example, used OM techniques to compare the careers of musicians active in 18th century Germany. Macindoe & Abbott (2004) used optimal matching to assess the causes and consequences of different career paths leading to private legal practice.

In optimal matching, two elementary operations are used to transform one sequence into another. The sequences consist of strings of well-defined elements that can, but need not repeat. The first operation, *replacement*, involves replacing one element with another element. The second operation, *insertion-deletion* or *indel*, involves inserting or deleting an element from a sequence. The distance (or difference) between two sequences is a function of the number of these elementary operations. Two sequences that require a large number of operations to transform one into the other are said to be further apart (i.e., more different) than two sequences that require a small number of operations. For complex sequences, there is typically more than one way to effect a transformation. The minimum distance, defined in terms of the number of

elementary operations needed to transform one sequence into another, is referred to as the edit or Levenshtein distance (Levenshtein 1966).

Sequence analysis methods have several advantages over the maximum likelihood and event history models typically used to study political careers. First, sequence analysis makes no assumptions about the relationship between the office-holding events that comprise political careers. Second, sequence analysis methods allow the researcher to directly compare career sequences. The OM algorithm calculates a distance for each pair of careers that summarizes any differences in the number, type and order of offices occupied. Third, sequence analysis allows the researcher to modify how the OM algorithm weights *replacement* and *indel* operations. If, for example, a researcher feels that the transition between the House and Senate ought to be treated differently than the transition between the state legislature and Senate, this intuition can be incorporated by weighting a House-Senate replacement differently than a state legislature-Senate replacement. Thus, sequence analysis is a flexible tool that can be adjusted to suit the particular data being analyzed or to test alternative conceptions of political mobility.

The advantages of flexibility are also the source of sequence analysis's greatest weaknesses. Unfortunately, there are no established guidelines that define for the researcher: 1. how offices are to be coded, or 2. the proper weighting for replacement and indel operations. These are theoretical questions that require detailed knowledge of the subject matter being studied and, ideally, empirical assessments of alternative choices. In addition, because sequence analysis methods rely on scaling and other statistical procedures, the researcher must be wary of the shortcomings in these techniques. Some of the major problems with scaling procedures like cluster analysis

include the multiplicity of algorithms (Everitt 1993) and the stopping rule used to determine the number of groups (Milligan & Cooper 1985). For maximum likelihood techniques, traditional caveats about model specification, omitted variable bias and heteroskedasticity apply.

The use of sequence analysis methods imposes additional burdens on the data collection process. In existing datasets like *The Roster*, variables intended to summarize the previous political experiences of officeholders are insufficient for reconstructing complete career sequences. Researchers can sometimes infer whether an individual has held a particular office or any elective office at all. Sometimes, it is even possible to calculate the amount of time spent in a particular office. These crude indicators of previous political experience, however, are inadequate. One possible reason that political scientists have failed to uncover a relationship between how politicians reach an office and what they do while there is because the former has never been properly measured. To address this problem, I collected complete career sequences for nearly 6,000 politicians occupying six different offices in the U.S. between 1809 and 1940.

Finally, sequence analysis methods can be difficult to implement. Fortunately, routines for calculating Levenshtein distances have recently been developed for both the R (Buchta & Hahsler 2007) and STATA (Brzinsky-Fay, Kohler & Luniak 2006) packages. Nonetheless, applying sequence analysis to large datasets remains computationally intensive. The OM algorithm calculates a distance measure for each pair of career sequences in the dataset. For the subsample of 3,041 House careers collected for this dissertation, for example, the *N*-x-*N* matrix of distances contains 4,622,320 unique distances.

With all of these challenges, sequence analysis methods represent the most straight-forward way of comparing complex career sequences. Performing these comparisons will enable political scientists to address the question of whether the path to office influences political behavior and institutional development. The approach described here can complement individual-level models of career decision-making, but it differs in key respects. First, rather than ignore the basic patterns among political careers, the chapters to follow seek to identify the major paths to different offices. Second, instead of concentrating on the career within particular institutions, like the U.S. Senate, this dissertation attends to the beginning, middle and end of career sequences. Third, rather than assume that previous political experiences are irrelevant, this work develops hypotheses about the relationship between career paths and behavior in office, and tests them with empirical data. Finally, whereas nearly every empirical study of political careers focuses on a single office or discrete transition, this dissertation examines multiple offices and transitions. In doing so, I am able to see whether trends like increasing careerism were limited to the U.S. House or extended across the U.S. federal system.

4. Conclusion

Political scientists have been said to excel in data collection, but lag behind scholars from other disciplines in methodological innovation and sophistication. Of this disparity in the strength of data collection efforts and methods, King (1998) has recently written:

> This imbalance in political science research between state-of-the-art data collection and weak methods means that future statistical innovations are likely to have disproportionate impact on scholarly research (p. 3).

With respect to career studies, substantial progress in both data collection and methodological innovation is needed if researchers are to find the elusive link between the backgrounds and experiences of politicians, and what they do while in office.

The data for this dissertation include some of the most detailed information about the political experiences of U.S. elected officials ever assembled. They include complete career sequences for approximately 6,000 individuals who served in any of six public offices. The offices I focus on are the U.S. cabinet, federal judge, Senate, House, governor and big-city mayor. Lacking the resources to compile a complete time series for all of these offices, I opted for a sampling approach. The 6,000 careers are spread across five historical time periods – 1809-1828, 1848-1860, 1868-1882, 1890-1912, 1928-1944 – with every individual beginning service within these intervals coded for analysis. While this scheme is not ideally suited for assessing the effects of institutional changes that occur at particular moments, it does allow me to measure and explain differences in career patterns within and across offices, and over time.

The sequence analysis methods described in the previous section represent a set of tools for uncovering difficult-to-discern patterns in datasets where the unit of analysis is a sequence of events rather than one event occurring in isolation. Past scholarship typically models the political career as a series of disconnected choices generated by a stochastic process. For standard statistical techniques, this independence assumption is necessary. Nonetheless, it ignores potentially relevant information about the sequence of events leading to a particular choice. Sequence analysis methods require no rigid assumptions

about the data generating process. However, the analyst must make judgments about how to weight replacement and indel operations, and in which scaling procedures to use. Thus, like other statistical tools, sequence analysis methods offer no substitute for detailed knowledge of subject matter.

Sequence analysis methods can be readily extended to other careers. Analyzing career sequences in other political systems would allow researchers to further study differences in electoral system institutions and structural characteristics (e.g., advanced versus developing countries). Political careers, however, represent just one of many phenomena that involve sequences of events. Political scientists have focused on the path that nations take to modernization (Rostow 1960; Inglehart & Welzel 2005). Economic change, political development (Huntington 1968), revolution (Skocpol 1979) and the rise of nationalism (Deutsch 1961) are all outcomes that researchers have modeled as historical sequences. Contemporary public policy processes, including lawmaking and budgetary processes (Padgett 1980), can be modeled as decision-making sequences. Finally, political scientists have offered a variety of cyclical theories to explain critical elections (see Mayhew 2000), presidential leadership (Skowronek 1993) and the resurgence of racism (Woodward 1966). Given the importance of these subjects, the potential contribution that sequence methods can make is substantial.

Chapter 2

Putting the "Career" Back Into Political Career Studies:
Does How They Got There Determine What They Do?

Careers have been studied as thoroughly as any political phenomenon. The number of published books and articles on political careers suggests that the attention paid to them rivals that given to topics like regime type, elections, and international conflict. Unfortunately, while the consequences of those topics are well-established, the "so what" question continues to bedevil career studies. There are ample theoretical reasons to expect that differences in who politicians are and how they reach office will impact both political behavior and institutional development. The Framers believed this to be the case and designed the Constitution so as to maximize the probability of electing men of good character and experience to public office. However, after decades of research, the most dedicated students of careers were declaring frustration at the failure to conclusively link political recruitment and outcomes (see, for example, Matthews 1984).

One reason for the frustration is that the political career is difficult to define and study. The definition of the word career is ambiguous. The dictionary defines "career" alternatively as "one's calling" and "one's occupation." Thus, the term combines both intangible intentions – e.g., the desire to make a difference – as well as observable achievements – e.g., years in public office. Perhaps the best definition comes from Wahlke et al. (1962):

> A political career, like careers in other pursuits, is a more or less typical sequence of events, a developmental pattern in the life histories of politicians moving into positions made available by the framework of institutions (p. 71).[1]

Several prominent scholars have rejected the idea that an individual's involvement in politics qualifies as a career in the ordinary sense of the word (Lasswell 1960). Others similarly deny that politics constitutes a profession or that politicians can be professionalized in the way doctors, lawyers, academics and various businessmen are (King 1981).

That the sequence of events that forms a political career resists simple classification and measurement is indisputable. Political careers are more irregular than other types of careers. There are a plethora of entry points into politics, different types of public office and alternative routes for advancement. Whether and how individuals make their way up the political ladder might depend as much on chance as on individual attributes and ambition. Political institutions like primary elections, term lengths and overlapping district boundaries also give shape to careers. Finally, the activities of party organizations, which exist to place individuals in public office, and the preferences of voters can facilitate or block individual desires. All of these factors combine to define a complex structure of political opportunity that channels and is channeled by individual career decision-making (Schlesinger 1966).

While it is true that no two political careers will be exactly alike, it is important to understand what "typical" career sequences look like, if they exist. Whether or not individual politicians and office-holding sequences satisfy objective definitions of "the

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[1] This definition is also cited in Prinz's (1993) excellent review of the careers literature.

professional" or "the career," the political career exists as a subjective phenomenon.

Politicians develop expectations about what careers are possible or appropriate. These

expectations shape their decisions about whether to, for example, run for reelection or

retire from politics. Given the substantial resources invested in compiling career data,

one might think that the "typical" career, i.e., the modal paths to office, would have been

established long ago. In the 1950s, Matthews (1954) observed that:

> … a major gap in the facts concerns the political career patterns of
> decision makers. For the United States, especially, it would be useful to
> know the usual pattern or sequence of public offices leading to the
> Presidency or Congress and whether or not there are differences between
> political career patterns in one-party or two-party areas, between the
> career patterns of Democrats and Republicans, and so on. Questions such
> as these have yet to be systematically explored (p. 59).

More than 50 years later, the gap has narrowed, but questions about the patterns among

political careers and importance of career sequences are still waiting to be addressed.

In the sections that follow, I review several major strands of the careers literature.

This review is neither comprehensive nor complete. Excellent reviews on the subject of

recruitment have been written by others.[2] My purpose is limited to describing the major

approaches to studying political careers, highlighting major findings, and discussing their

advantages and disadvantages. In doing so, I argue that political scientists today are not

much closer to addressing the concerns raised by Matthews than when he identified them

decades ago. Recent work ignores the "pattern" question altogether, using career data to

illustrate the effects of political institutions and other variables of interest to political

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[2] On legislative recruitment in the U.S., see Matthews 1984, Fowler 1993, and Moncrief 1999. On recruitment and retention in Western Europe, see Putnam 1976, and Patzelt 1999.

scientists. The effects of previous political experience, i.e., the "so what" question, have received insufficient attention.

The chapter proceeds as follows. The next section briefly reviews the extensive literature on political recruitment. The third section focuses on institutionalization and its relationship to increasing careerism among members of the U.S. House of Representatives. The fourth section discusses more recent studies that attempt to model career decision-making at the individual level. The fifth section examines studies of political ambition. The final section concludes.

1. Political Recruitment

Recruitment studies attempt to explain: 1. why individuals become candidates for public office, and 2. whether recruitment matters. Early studies of recruitment paid close attention to the social backgrounds of politicians. Using biographical directories and legislative handbooks in countries across the world, researchers have definitively shown that elected officials are better educated, work in higher-status occupations and come from wealthier backgrounds than the people they represent. This finding applies to legislatures at all levels of government in the U.S., and in deliberative bodies from advanced societies and developing countries, and even non-democratic regimes (see Matthews 1984, for a list of references). Differences in social status are especially pronounced in developing countries, though politicians are more like the average citizen than are business elites or civil servants (Aberbach, Putnam & Rockman 1981). In the U.S., lawyers comprise a disproportionate share of those elected to Congress (Schlesinger 1957; Eulau & Sprague 1964).

The classic study in this vein is *The Power Elite* by C. Wright Mills (1956), which argues that most important decisions are made by a small group of corporate managers, political chieftains and military leaders. These elites have common values and attitudes that spring from similarities in class, ethnicity, education and executive training. Empirical researchers have had difficulty verifying Mills' provocative claim about the relationship between social background and political decision-making. While much effort has been expended in compiling detailed information about the social backgrounds of politicians, attempts to link these differences to voting and other behaviors have met with limited success. Bogue et al. (1976), for example, compiled a large number of variables on the backgrounds and experiences of those elected to Congress. Through a series of cross-tabs, they found that these attributes have not changed much over the course of history and, as such, cannot explain changes in voting behavior or institutional development.

Political psychologists have attempted to discover whether politicians have different personalities than the people they represent. Lasswell (1948) suggested that politicians suffered from unrealized needs for deference and low estimates of self-worth. The aggressive pursuit of power compensates for these deficiencies. *Woodrow Wilson and Colonel House* (George & George 1956) is the most faithful attempt to apply Lasswell's theory to a major figure. George & George portray Wilson's political ambition and personal style as an attempt to overcome childhood feelings of personal inadequacy. Subsequently, scholars have studied the political personality using more systematic methods, including surveys of elected officials (McConaughy 1950; Browning 1968) and personal interviews (Barber 1965; Payne 1984). These studies have uncovered

minor differences among politicians, and between politicians and those they represent. However, they have yet to explain how psychology and the political environment interact to produce behavior (Greenstein 1967).

Recognizing the difficulty of measuring personality, some researchers have focused on the incentives for political participation and goals among those in office. Payne & Woshinsky (1972), using interviews with elected officials, argued that politicians are typically motivated by one overriding incentive (e.g., status attainment, personal mission), but that incentives vary among legislators. More recently, scholars have stipulated a variety of office-based goals for politicians and derived predictions about behavior and institutional development. Schlesinger (1966) distinguished between politicians whose ambitions were directed toward occupying a single office for a short period of time (discrete), remaining in their current office indefinitely (static), or moving up the political ladder (progressive). Fenno (1960) suggested that all politicians are motivated by a combination of reelection, power and policy goals. Mayhew (1974) simplified the assumption by assuming that all legislators are single-minded seekers of reelection. He argued that the organization of the U.S. Congress was perfectly adapted to the reelection goals of its members.

Career studies were heavily influenced by theories of pluralism that depict political outcomes as resulting from the interplay of individual attributes and actions, party rules, interest group activity and electoral system institutions (Fowler 1993). Critical in these "process" models are the mechanisms used by political parties to choose candidates for public office. In *Southern Politics*, Key (1949) found that the absence of two-party competition favored self-starting candidates with high name recognition and

fundraising capacity. This form of politics, Key argues, leads to policies that favor the wealthy. Sorauf's study of party politics in Pennsylvania (1963) described a much different setting where parties regularly intervene in primaries to promote favored candidates. Researchers have also studied the role of parties in recruitment in other countries with different electoral systems. Ranney (1965), for example, found that national party elites in Great Britain exercised substantial control over which candidates were listed. The case studies in Gallagher & Marsh (1988), however, suggest that the degree of centralization varies widely, though the share of voters participating in selecting candidates is much lower than in the U.S.

The process models of recruitment attempted to establish broad generalizations about the relationships between political institutions, party organization and recruitment on the one hand, and recruitment and outcomes on the other. More recent work has focused on the mechanisms by which institutions, parties and other factors influence who serves in public office. To the extent that these factors shape recruitment, they do so through the calculations of individual, self-interested candidates for public office. Black (1972) represented the individual's decision-making process as a simple cost-benefit calculation:

$$U(O) = p(B) - c$$

where $U(O)$ is the utility of an office, p is the probability of winning, B the benefit of holding and c the costs of seeking the office. Jacobson & Kernell (1981) used this framework to call attention to factors (especially national political trends) that affect the probability of winning. In bad Republican years, for example, more Republican incumbents will retire and fewer quality candidates will emerge. Those that do will

receive less money from strategic campaign contributors. Thus, national political trends impact congressional elections even if individual voters pay little attention to them.

Strategic politicians and the conditions that shape their decisions to enter and the electoral success they achieve have been at the center of congressional election studies over the past few decades (Moncrief 1999). Researchers have attributed the decline in competition for House seats to both strong incumbents (Johannes & McAdams 1981; Rivers & Fiorina 1989) and weak challengers (Jacobson 1989, 1990). Sophisticated models, including structural equations and two-stage setups, have been developed to cope with the endogenous relationship between individual candidates, and local and national trends (Fowler 1993). Recent work finds that these factors work differently on different types of challengers, e.g., amateurs and incumbent-party challengers (Lazarus 2008).

Separate literatures have developed on recruitment of women and minorities, with researchers paying particular attention to political institutions, social norms and expectations. Cole (1976) found, for example, that at-large elections, nonpartisanship and the size of minority populations did not affect the careers of black politicians in New Jersey. Differences in the social environment of blacks and whites were more telling. Others, however, have found that the prospects of black candidates are affected by the grouping of blacks into minority-majority districts (Grofman and Handley 1989) and "racial" voting (Bullock and Campbell 1984). Many studies have concluded that black representation does not improve the well-being of black constituents (Browning, Marshall & Tabb 1990), though Hajnal (2001) argued that it can impact white attitudes. Finally, researchers are beginning to find that race and gender influence roll call voting

(Rocca et al 2009). The policy priorities of blacks and women also appear to differ from those of their colleagues (Thomas 1994).

More attention has been given to the recruitment of women in the U.S. and other countries. Women are vastly underrepresented in most countries and at nearly every level of government (Darcy et al. 1994; Norris & Lovenduski 1995). Research has established that gender differences in party support, campaign funding and electoral recognition wash out at the general election stage (Darcy, Welch and Clark 1994). Women's underrepresentation in Congress and other offices appears to reflect a mismatch between the supply of female candidates and available opportunities to run (Fowler 1993). Norris & Lovenduski (1993) similarly find that selection mechanisms in the UK do not adversely affect women's chances of winning office. Women, however, appear to be less represented in jobs that lead to parliamentary careers and are able to spend less time performing party work.

The emergence of the "rational-actor" approach has been a critical development in career studies. This approach represents aggregate recruitment patterns as an accumulation of decisions by individual candidates to pursue various office-based goals under the constraints imposed by existing institutions, party competition and selection rules, and voter preferences. Researchers have used rational-actor models to clarify the conditions under which different types of individuals will enter politics. Interestingly, whereas Jacobson & Kernell (1981) attempted to link macro-level trends with individual agency, most rational-actor models ignore broader recruitment patterns. As a result, their effectiveness in explaining aggregate-level changes – e.g., the relative attractiveness of different public offices (Kernell (1981), increasing careerism (Polsby 1968),

professionalization (Squire 1988, 1992) and the decline and resurgence of political parties (Herrnson 1990; Wattenberg 1996) – has been limited (Moncrief 1999).

2. Institutionalization

Modern scholarship on political careers was jumpstarted by Polsby's (1968) attempt to apply the concept of institutionalization (Eisenstadt 1964; Huntington 1965) to the U.S. House of Representatives. Institutionalization, according to Polsby, is a developmental process that culminates in an organization that is well-differentiated from its external environment. Descriptively, such organizations are characterized by three features: 1. well-established boundaries, 2. internal complexity, and 3. universalistic decision-making criteria. Huntington (1965) argued that high levels of institutionalization are necessary for an organization to successfully allocate resources, solve problems and contain political conflict (see also Polsby 1968). In this sense, institutionalization was one of the first theories relating the features of an organization to its performance.

For empirical researchers, institutionalization poses difficult measurement challenges. Indeed, the bulk of Polsby's original article was devoted to developing indicators of institutionalization's three defining features. To measure the difficulty of gaining membership – an indicator of institutional boundaries – Polsby collected data on the share of freshmen and average terms served by members in each congress between 1789 and 1967. Tables showing a precipitous decline in turnover (from 47 percent in 1877 to 21 percent in 1965) and increase in terms of service (2.11 to 5.65 terms over the same period) indicate that the House had become more difficult for outsiders to penetrate.

Data demonstrating a decline in seniority violations in the appointment of committee chairmen (60 percent between 1881 and 1889 to less than one percent between 1951 and 1963) similarly marked a wholesale shift toward universalistic decision-making criteria.

In using career data to measure institutionalization, Polsby (1968) offered an initial statement about the relationship between legislative careers and institutional development. It is a mild statement that simply asserts an association exists. Correlation, however, is not the same as causation. Polsby devoted little space to the causes and consequences of institutionalization. In searching for causes, he cites Durkheim's argument about the relationship between the volume and density of societies, and the extent of the division of labor. This was reformulated as a functionalist argument ascribing institutionalization to government responsibility and influence over economic decision-making (p. 164). Polsby did provide a long list of institutionalization's consequences, including the displacement of resources, *increased careerism*, decentralization of power, greater institutional prestige and promotion of professional norms. The list is problematic in that variables used to indicate the extent of institutionalization are included as consequences. Thus, in compiling career data, the researcher measures both institutionalization and its consequences.

Confusion over whether careerism is merely a feature of, causes or results from institutionalization has persisted in subsequent studies of the congressional career. Initially, political scientists followed Polsby in citing institutionalization as a leading cause of House careerism. Bullock (1972), for example, observed that the share of House members with 10 or more terms of service more than doubled from 1941 to 1971. He attributed this growth in careerism to greater electoral security and new reasons for

staying – e.g., the seniority system, expanding scope of federal power and *institutionalization*. Cooper & West (1981) and Hibbing (1982) similarly argued that growing disaffection with House service – in the form of increasing workloads, reduced *institutional capacity*, and greater constituent demands – was the key cause of increasing retirement rates during the 1970s.

Complementing these studies were efforts to establish a firmer empirical link between institutionalization and rising careerism. The most authoritative examination was performed by historians. Bogue et al. (1976) assembled a comprehensive dataset on the background, experience and legislative tenure of those serving in the House and Senate from 1789 to the present. Based on a detailed analysis of cross-tabs, they found that the backgrounds and experiences of those reaching Congress did not change much over the course of history. Thus, neither changes in attributes nor changes in political experience can explain rising careerism. Having ruled out most alternative explanations, Bogue et al. concluded that one must look to changes inside the House and Senate, i.e., institutionalization, to account for Polsby's trend.

Congressional scholars obliged with narratives about the emergence of the textbook Congress in the early 20th century. The textbook Congress was organized by powerful committees, with the seniority rule determining advancement to committee chairmanships (Polsby, Gallaher & Rundquist 1969; Shepsle 1989). This universalistic system filled the vacuum left by the fall of the strong Speaker system in 1910 (Jones 1968). In the textbook Congress, committees enjoy near-complete control over policies in their jurisdictions (Shepsle & Weingast 1987). They are composed of members with electoral interests in the policies they control (Shepsle 1978). With assignment to and

advancement within committees governed by an automatic process, members had stable and predictable paths to power in the chamber and a "credit-claiming" resource with which to pursue reelection. Under this system, members were seldom inclined to leave and nearly impossible to unseat.

Not all researchers have been satisfied with these internal explanations for rising careerism. Several studies seek to reverse the causal relationship, citing rising careerism as an explanation for institutional changes. Katz & Sala (1996), for example, explicitly link stricter adherence to the seniority norm to the changing electoral incentives of members following widespread adoption of the Australian ballot in the 1890s. Rohde (1991) similarly cites diverging electoral interests among senior Southern Democrats and more junior northern Democrats to explain changes to the committee system in the 1970s. With respect to Polsby's trend, many scholars accept that congressional service has become more attractive, but have looked for factors other than institutionalization to explain it.

Researchers have identified three main alternative explanations for rising careerism. The first focuses on changes in national economic organization during the late 19th century.[3] The growth and integration of the U.S. economy after 1850 (Easterlin 1958, 1966; Chandler 1977) placed unprecedented demands on national political institutions. National administrative capacities grew in response to these challenges (Wiebe 1967; Skowronek 1981). Inside Congress, traditional structures were wholly inadequate for managing this administrative apparatus. In addition to delegating greater resources to the executive branch (White 1958; Sundquist 1981), congressional majorities

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[3] This explanation restates Polsby's functionalist reformulation of the density hypothesis.

approved reforms to expand institutional capacity (see Schickler 2001). These reforms included stronger committees and adherence to seniority in assigning committee slots. Such changes enhanced capacity by divvying up the growing workload and encouraging specialization. The combination of greater institutional prestige and predictable routes for advancement added to the attractiveness of House service.

The second alternative explains rising careerism with reference to changes in party competition. The readmission of Southern states following Reconstruction ushered in a period of unprecedented electoral parity between the two major parties. Between 1877 and 1896, control of the House changed hands five times (Stewart & Weingast 1992). The presidency and the Senate remained solidly Republican, though Democrats broke through here as well, winning the Senate in 1878 and 1892 and electing Grover Cleveland in 1884 and 1892. Electoral volatility took its toll on House and Senate incumbents, with members suffering the consequences for poor economic performance or a lackluster candidate at the top of the ticket. Price (1971, 1975, 1977) argued that the 1896 presidential election ended this system by eroding Democratic strength in the northeast and Midwest. Republicans garnered a stranglehold on congressional districts in these areas. Democrats continued to control Southern districts. Careerism developed as electoral obstacles to reelection were removed.

The third alternative focuses on changes in electoral system institutions that reduced the effectiveness of national party campaigns and encouraged House incumbents to cultivate a personal vote (Cain, Ferejohn & Fiorina 1987). The most important change was adoption of the secret ballot in the 1880s and 90s (Rusk 1970). This reform severed the link between candidates of the same party by replacing the party strip ballot with an

official ballot that listed all candidates for each office. Subsequent implementation of direct primaries for congressional offices reinforced the independence of legislators. The first statewide primary law was passed in Wisconsin in 1902. By 1920, all but four states were using primaries to elect at least some statewide candidates (Hershey 2005). Engstrom & Kernell (2005) found that ballot and primary reforms reduced the size of presidential coattails.

The adoption of the secret ballot and primary elections coincided with the end of rotation practices (Whitridge 1889; Struble 1979; Kernell 1977). Rotation agreements between factions of district and state party organizations, or imposed by party leaders compelled House incumbents to give up their seats after one or two terms. These agreements provided opportunities to serve in Congress for many among the party faithful while keeping the peace among various factions of local and state party organizations. Failure to observe these agreements often resulted in one or more factions running an independent slate of candidates or election contests by individuals claiming the official party designation. The demise of these practices, assisted by electoral system reforms, removed one of the most important reelection barriers that 19th century incumbents faced.

While congressional scholars have turned to alternative explanations for rising careerism, others have usefully applied the institutionalization framework to bureaucratic, executive and legislative institutions around the world. Keohane (1969) used the concept to describe the development of the United Nations General Assembly. Comparative scholars have applied institutionalization to legislatures in emerging democracies (Hibbing & Patterson 1994). Institutionalization has also provided a conceptual

framework for investigations of older legislatures, such as the British House of Commons (Hibbing 1988), the Portuguese Parliament (Opello 1986), Italian Parliament (Leonardi et al. 1978), Brazilian Chamber of Deputies (Santos 1999), German Bundestag (Schuttemeyer 1994), and Yugoslav Assembly (Cohen 1980). O'Brien and Luehrmann (1998) use it to describe Chinese legislatures.

In American politics, researchers have used an institutionalization framework to characterize the development of a variety of institutions and processes. Ragsdale & Thies (1997), for example, describe the institutionalization of the Executive Office of the President, Office of Management and Budget and White House Office. They argue that the presidency emerged as an institution in the 1970s. Canon (1989) applied the concept to the development of leadership posts in the House and Senate. Haeberle (1978) found that the subcommittee system became institutionalized following adoption of the "subcommittee bill of rights" in the early 1970s. Squire (1988, 1992) distinguished the concepts of institutionalization and professionalization, and used them to describe the evolution of legislatures and legislators in California and other states.

The different explanations for rising careerism constitute a central debate in career studies. Unfortunately, the causes of congressional careerism are over-determined. Polsby's trend occurred over a stretch of history that is populated by multiple institutional reforms and external shocks. Modeling these different events – i.e., comparing what came before with what came after – is exceedingly difficult. Katz & Sala (1996), for example, arbitrate between ballot reform, realignment and institutionalization explanations using three dummy variables. Each of these events poses a history threat to validity with respect to the others. Another difficulty in arbitrating among different

causes is the absence of an external baseline. Most studies compare the House at different points in its history, though researchers have shown that both institutionalization and rising careerism were occurring elsewhere. To date, researchers have failed to appreciate the possibility that both institutionalization and rising careerism, as historical events, extended beyond the halls of Congress.[4]

In a recent review of the institutionalization literature, Hibbing (1999) acknowledges the confusion about its causes and advocates studying the process in various historical eras and across countries. Examining the House alongside other institutions can also shed light on whether institutionalization was strictly a legislative phenomenon. (In Chapter 4, I show that other public offices in the U.S. were displaying symptoms of institutionalization, i.e., rising careerism.) Hibbing also cautions researchers against simplifying the link between institutionalization and rising careerism. Institutions with high turnover can still be institutionalized if the impact of turnover is minimal. Similarly, political parties can be institutionalized even where legislatures are not, and strong party norms can actually impede institutionalization. Finally, constitutional design (e.g., the imposition of term limits) can circumscribe the extent of institutionalization.

3. Individual-Level Models of Retirement

Complementing studies of recruitment and institutionalization is a new wave of individual-level models of career decision-making. These models, which are used to

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[4] In Footnote 11 of his 1968 article, Polsby hints that institutionalization extended to other U.S. offices. He cites the professionalization of the U.S. military as an example and, in a provocative table, shows that justices appointed to the Supreme Court were enjoying lengthier tenures.

characterize the choice process facing members within institutions, fit comfortably within the strategic politicians framework developed by Jacobson & Kernell (1981). This branch of career studies assumes that a better understanding of the individual career calculus is necessary if scholars are to fully comprehend the changing patterns in aggregate-level time series (Hall & Van Houweling 1995). Individual-level models have drawn attention to a variety of factors that shape the decisions of legislators to run for reelection, retire or move to another office. They have also contributed several methodological innovations, including the implementation of event history techniques to overcome problems associated with the use of longitudinal data.

Researchers have approached the individual choice process by separating the office-holding sequences that form political careers into different categories of decisions. The decisions include the initial entry into politics and, for incumbents, reelection or retirement choices made at regular decision points. Studies of the latter kind, which account for variations in the tenure of incumbents within particular offices, can be separated into two categories. The first category consists of studies that model retirement over a brief period of time, e.g., for legislators, one or two congresses. The second category includes studies that use a longer time series, following individuals over the course of a cabinet or congressional career. While the majority of these studies are devoted to explaining tenure in the U.S. House, studies of other institutions have also been attempted.

Most studies in the first category are devoted to explaining the large number of retirements that occurred prior to the 1992 congressional elections. The 1992 elections provide an excellent opportunity to study retirement because a confluence of factors

made it an attractive option for many House incumbents. First, reapportionment and redistricting processes following the 1990 census left several members without a home district and others facing constituencies that differed markedly from those they were accustomed to representing. Second, many House incumbents were caught up in a well-publicized scandal involving the House banking system, whereby members wrote checks not covered by their accounts with the House bank. Third, 1992 was the final year that members elected prior to 1980 could take advantage of a campaign finance loophole that allowed them to convert unspent campaign funds into cash. Thus, studying 1992 allows scholars to distinguish between multiple causes of congressional retirement.

Jacobson & Dimock (1994) focus on the impact of the banking scandal. Using a series of unordered probit equations, they find a positive relationship between the number of overdrafts issued by incumbents and the probability of exiting the House – whether by retirement, or primary and general election defeats. They also show that over-drafters were more likely to attract strong challengers, contributing to greater levels of campaign spending. Jacobson & Dimock argue that their findings reflect strategic decision-making by both incumbents and potential challengers. However, since they do not link their models of electoral success and retirement, it is unclear just how strategic the retirements were. Moreover, while they include controls for redistricting and unspent campaign cash, their equations are relatively spare compared to other retirement models.

Groseclose & Krehbiel (1994) argue that the grandfather clause, allowing members to convert unspent campaign funds to cash, had a greater impact on retirements in 1992 than either redistricting or the banking scandal. Their model includes variables representing each component of Black's (1972) cost-benefit formula – the benefits of

holding, probability of winning and costs of seeking a House seat. The formula is embedded inside the likelihood function, whereby the effects of variables measuring benefits are discounted by those measuring winning. This discounting contributes to the study's main findings. Moreover, in failing to separately estimate the probability of winning, and excluding incumbents who chose to seek another office, the authors give an incomplete portrait of the strategic setting.

Hall & Van Houweling (1995) similarly find that financial incentives had a major impact on retirements in 1992. Unlike previous studies, they weigh the value of unspent campaign funds against other financial incentives, including recent increases in congressional pensions that upped the value of a House seat. They find that these post-retirement benefits were far more important than the one-time windfall offered by the grandfather clause. Hall & Van Houweling also elaborate a theory of intra-institutional ambition, suggesting that well-placed members will be less likely to give up their seats. Theriault (1998) builds on this theory of intra-institutional ambition. He finds that members with lengthy tenures, but low-ranking positions in the House committee system were the most likely to retire. In explicitly measuring disaffection, Theriault offers a link with aggregate studies of retention that cite disaffection as a leading cause of retirements (Frantzich 1978; Hibbing 1982; Cooper & West 1981).

These studies, which model the retirement decision for a small subset of officeholders at a single decision point, have several advantages. Their primary advantage lies in the ability to incorporate micro-level variables – e.g., the grandfather clause in 1992 – that affect the choice process at one decision point, but are unimportant or unavailable for officeholders at other decision points. Limiting the analysis to a single

or small number of decision points also reduces the possibility of history threats to validity, which are inherent in studies that model retirement decisions over long periods of time. Researchers are just beginning to exploit these advantages for decision points outside the 1992 congressional elections. Carson & Erikson (2005), for example, examine the impact of House incumbents' votes for presidential candidates following the disputed election of 1824. Their model does not assess the effects of these votes on strategic retirement, but their empirical approach is similar to the models above. MacKenzie (2008) explores the relationship between at-large elections and retirement, and assesses the impact of the Redistricting Act of 1929.

The disadvantages these studies have are twofold. One problem is their inability to account for the possibility that choices made at one decision point are affected by choices made at earlier decision points. Jones (1994) has pointed out the dangers of failing to account for duration dependency across reelection and retirement trials. Potential differences in the choices made by incumbents at previous decision points introduce a form of unobserved heterogeneity into the sample. Another disadvantage lies in the difficulty of modeling the complete set of choices available at each decision point. All of the models cited above exclude incumbents who decided to seek another office, thereby ignoring the possibility that members have choices other than reelection and retirement. Presumably, this reflects the fact that the number of incumbents choosing this option is too small to allow a separate equation for ambition. The failure to simultaneously examine all possible alternatives means that these models omit relevant variables that affect the choice process.

The second category of individual-level retirement models examines the choice process over an extended period of time. What these models might lack in the specificity with which certain causal factors can be measured, they make up for in the generalizability of their findings. By including more individuals and decision points in the analysis, the effects of causal factors can be assessed with greater confidence. Estimates are likely to be more stable than those based on a small group of officeholders or choices made at a single decision point. Similarly, with a larger sample of individuals and decision points to work with, it is possible to simultaneously model all of the alternative choices available to officeholders, even those that occur infrequently.

Kiewiet & Zeng's (1993) analysis of career decision-making by House members between 1947 and 1986 is the most oft-cited study in this vein. Using a comprehensive dataset that includes 8,353 individual career choices, they assess the effects of a variety of causal factors, including age, leadership position, majority status, ideological position, and electoral vulnerability – i.e., previous electoral margin, redistricting, personal scandal. Because these career decisions occurred over an extended period of time, Kiewiet & Zeng are able to assess the impact of institutional reforms, i.e., the subcommittee bill of rights. They also model several aspects of the opportunity structure (Schlesinger 1966), such as the availability of an open Senate or gubernatorial seat. Using a multinomial logit procedure, Kiewiet & Zeng simultaneously estimate the effects of these variables on retirement and seeking higher office.

The large-*N* approach, with the multinomial logit procedure allowing the researcher to simultaneously model retirement and ambition, has many attractive qualities. Its implementation in Kiewiet & Zeng (1993), however, requires two caveats.

First, like the models cited above, the authors fail to disentangle the effects of their independent variables on reelection and retirement. Some variables affect retirement directly, others indirectly through their effects on reelection. Some variables have both effects, and these might point in different directions. With respect to age, for example, researchers have suggested that older incumbents are less successful campaigners (Hibbing 1991). Previous retirement studies, however, find that age is positively associated with retirement rates. Second, Kiewiet & Zeng treat each of the 8,353 choices included in the analysis as an independent observation. They acknowledge that choices made by the same individual at different decision points are likely to be correlated, but they offer no solution to the problem.

Brady et al. (1999) provide a partial fix to the first problem by estimating separate models for incumbent reelection and the retirement decision. Their focus, however, is on arbitrating between the different explanations of rising careerism cited above using data from 1870 to 1930. The models include variables measuring electoral system change (ballot reform, direct primary), economic organization (real income growth) party competition (before and after 1894) and pork-barreling (new federal building in the district). The authors find that reelection and retirement are shaped by different factors. Party competition and economic growth both substantially impacted retirement. Terms representing ballot and primary reforms were insignificant. Using a different specification, Kernell (2003) found greater support for both ballot and primary reforms. In a forthcoming paper, Kernell proposes a two-stage model that purges the reelection effects from several variables (e.g., previous margin) and then estimates their direct effects on retirement.

One solution to the second problem – correlation among choices made by a single individual over multiple decision points – is offered by Jones (1994), who studies retirement using an event history framework. Rather than assume that all choices satisfy the independence assumption, Jones attempts to account for serial correlation by modeling time explicitly. The baseline hazard rate is modeled with a linear duration term that assumes that the risk of retiring increases linearly with the number of reelection trials. Duration was a significant predictor of both retirement and ambition. Kernell (2003) used a similar event history approach to predict retirement and ambition between 1877 and 1940.

The two-stage and event history approaches represent the state-of-the-art among individual-level models of career decision-making. Researchers can allow the baseline hazard rate to assume a variety of forms – e.g., linear, log-linear, exponential, cubic spline – and assess the fit of alternative specifications (see Box-Steffensmeier & Jones 2004). More sophisticated duration models, such as the Cox model, can be applied where the dependent variable is continuous. Berlinski et al. (2007), for example, conduct an event history analysis of ministerial tenure in the United Kingdom between 1945 and 1997. In this case, tenure does not depend on successful navigation of regular reelection trials. As such, it makes little sense to model tenure in office as a series of discrete choices.

4. Political Ambition

Researchers studying political ambition seek to identify the paths to different public offices and model the decision to seek higher office. In the United States, where

political competition is organized by self-starting candidates for public office, much depends on individual ambition. Schlesinger (1966) posited that a politician's behavior in office is a reflection of her political ambitions. He identified three types of ambition, including: 1. discrete, where an individual intends to occupy a single public office for a specified term, 2. static, where an individual desires to remain in her current office, and 3. progressive, where an individual seeks a "higher" office than the one she currently occupies. Politicians who possess progressive ambitions behave in ways that will enhance their chances of moving up the political ladder – e.g., advocating positions that will appeal to those responsible for placing individuals in the desired office.

Schlesinger's critical insight was to recognize how the structure of political opportunity gives shape to political ambition. Access to high public offices like governor or senator is not distributed equally across the American political system. Schlesinger found, for example, that national leaders – presidents, vice presidents, cabinet members and Supreme Court justices – were disproportionately drawn from 13 states between 1900 and 1958. On the other hand, some states produced no national leaders at all. Schlesinger reasoned that states with no history of national leadership have truncated structures of opportunity – state politicians can safely ignore national politics. In states that frequently produce national leaders, politicians pay close attention to what transpires at the state level. Expectations for a national career being reasonable, politicians in these states are more likely to harbor ambitions for the highest offices.

If the structure of opportunity is to shape ambition, there must be some order to the movement of politicians between public offices (Prinz 1993). Schlesinger asserted that a hierarchy of offices existed in the U.S., with a large number of local and state

positions grooming politicians for service in a few prominent statewide and national offices. The sheer number of available public offices and the fact of open competition preclude overly rigid career paths. Nonetheless, the orderliness of career paths is enhanced by two features of the opportunity structure. The first is the party system. Schlesinger found that opportunity varies across parties, with Democrats enjoying advantages in some areas, Republicans in others. Within parties, advancement can be hampered if individuals occupy particular offices for long stretches of time. The second feature consists of the manifest conditions linking public offices. Transitions between two offices will be more likely if the positions have substantial constituency overlap (e.g., senators and governor), require similar tasks or functions (e.g., state legislator and U.S. Representative), and share a political arena (e.g., city councilman and mayor).

Schlesinger's (1966) study was a landmark, the most comprehensive effort to address the knowledge gap identified by Matthews (1954). Schlesinger examined the previous political experiences of presidents and vice presidents, members of the cabinet and the Supreme Court. His analysis of the career paths to these offices was mainly descriptive, emphasizing the position occupied just prior to the destination office. Most presidents, vice presidents and nominees, Schlesinger found, emerge from other elective offices; cabinet members tend to rise from lesser posts in the federal bureaucracy; Supreme Court members advance from lesser legal posts. Schlesinger studied governors and senators more intensively, producing elaborate frequency trees that map out the modal routes to each office between 1900 and 1958. He found that most candidates for these offices used relatively few paths. Twelve routes account for 70 percent of governors; 13 routes account for 70 percent of senators.

The attempt to link career paths to features of state opportunity structures was only partially successful. Schlesinger did find that politicians in northeastern and Midwestern states made extensive use of state legislative offices, while those in the West favored law enforcement positions. Democrats appeared to have more "political" careers than Republicans, though it is unclear why. The analysis offers only anecdotal evidence for the manifest hypothesis – i.e., transitions between offices sharing manifest conditions will be more frequent. Moreover, to accumulate a sufficiently large number of careers to calculate state-level opportunity rates, the entire 1900-1958 period is lumped together. Thus, Schlesinger did not assess whether career paths had changed over time. Nor is there a detailed analysis of how institutional reforms, such as primary elections, impacted political career patterns.

Given the data collection and conceptual difficulties associated with studying career paths in any detail, it is perhaps not surprising that Schlesinger's work, though widely cited and admired, has been largely neglected. Mezey (1970) duplicated parts of Schlesinger's analysis for the U.S. House. He uncovered 20 distinct paths to the office, but found no relationship between turnover in the state party system and the political experience of representatives. Kernell (1981) took up Schlesinger's claim that a hierarchy of public offices characterized by orderly paths to high office existed in the U.S. Using data on the career choices of four House cohorts spread over the period 1817 to 1902, Kernell concluded that the status of the House increased markedly during the 19th century. Increasing status was not accompanied, however, by the development of an elaborate pre-congressional career. Kernell speculated that decreasing Senate turnover

and the declining status of state offices left few opportunities for House members to realize progressive ambitions.

Career paths have received less attention outside of the U.S. In a review of the comparative literature on recruitment and retention, Patzelt (1999) concludes that while much work has been done to illuminate the effects of electoral system institutions on party strategies and electoral campaigns (see, for example, Taagepera & Shugart 1989; Carey & Shugart 1995; Cox 1997), there are few studies of the attractiveness of political careers relative to other leadership opportunities. Moreover, he states:

> We also have little research on how individual careers … play out within the institutional settings and the various formal or informal role hierarchies of different parliamentary structures. … Also, the overall effects of regime structure on recruitment patterns deserve much more attention than they have been given. There are hardly studies on the distinctive opportunity structure offered by a federal system … Likewise, we have no studies comparing the attractiveness of legislative careers in presidential, semi-presidential, and parliamentary regimes (p. 260).

Two notable exceptions include Rush's (1994) study of career paths leading to ministerial positions in Great Britain, and Scarrow's (1997) analysis of the European Parliament. Rush notes that ministerial positions are now pursued entirely through the House of Commons and the two major parties. The share of ministers from the House of Lords dropped precipitously after World War II even as the number of positions increased. Members' chances depend almost entirely on the frequency of elections and the prospects of their party. Scarrow finds that service in the European Parliament typically plays one of three roles in the careers of its members: 1. a political dead end, 2. part of a long domestic career, and 3. part of a European career. She finds that the share of those falling

into the third category has increased, and predicts that, as a result, the European Parliament might ultimately seek greater independence from national governments.

Researchers are also beginning to study how regime structure shapes political careers. The best example is Samuels (2003), which examines the impact of Brazil's federal structure on the ambitions of its national legislators. Like Schlesinger, Samuels argues that a hierarchy of offices exists in Brazil. The Brazilian political hierarchy, however, looks different than its U.S. counterpart. State and even local executive offices enjoy greater prestige than service in the national Chamber of Deputies, presumably because the former afford control over patronage resources. With members having little inclination to building careers within the national assembly, institutionalization there has languished. Party leadership positions are weak. Committee slots are not assigned according to the seniority norm, making legislative service both less predictable and less valuable. Samuels also shows that legislative campaigns are typically organized around gubernatorial rather than presidential contests. Gubernatorial coattail effects are strong in Brazil, giving governors an inordinate sway over legislators from their states.

Like recruitment and retirement studies, work on political ambition has been heavily influenced by the strategic politicians framework. Using Black's (1972) cost-benefit calculus, researchers have attempted to identify the correlates – e.g., personal attributes, political institutions, opportunities – of ambition and predict which politicians among a group of officeholders will attempt to seek higher office. Rohde's (1979) analysis of members of the U.S. House was the first study of this kind. Rohde assumed that all representatives would accept the opportunity to become a senator or governor if doing so was costless. The benefits, risks and costs of seeking a Senate seat or

gubernatorial post were assessed for different members and compared with actual transitions to these offices. On the benefits side, Rohde found that being a senator is better than being a governor, and a four-year term is better than a two-year term. House members were more likely to run for open seats, and in states where their party enjoyed a statewide electoral majority. Rohde also found support for Schlesinger's (1966) manifest hypothesis, with members from districts with substantial constituency overlap more likely to run for senator or governor.

Rohde's descriptive claims were re-analyzed by Brace (1984) using a multivariate probit model. Several of the original hypotheses were confirmed for members serving between 1952 and 1976. Brace also found that redistricting induced members to seek other offices, providing some initial evidence of the effect of political institutions. Similar analyses have been employed to study discrete transitions between other pairs of offices. Codispoti (1987) looked at the transition from governor to the U.S. Senate. Francis (1993) examined transitions from the House to the Senate, Palmer & Vogel (1995) from the House to the federal bureaucracy. Abramson, Aldrich & Rohde (1987) attempted to predict which U.S. Senators would seek the presidency.

A number of researchers have studied the transition between state legislatures in the 50 states and the U.S. House (Berkman 1994; Maestas et al. 2006). This transition is of particular interest for several reasons. First, state legislatures provide a large pool of potential House candidates. Second, recent studies indicate that the share of House members with state legislative experience is growing (Berkman 1994). Third, differences in state institutional settings enable researchers to assess the impact of term limits (Carey 1996; Carey et al. 1998) and legislative professionalism. Berkman (1994) argues that the

increase in the share of state legislators serving in the House reflects the professionalization of many state legislatures. Interestingly, professionalization also provides incentives for state legislative careerism (Squire 1988, 1992), making a run for the House more costly (Berkman 1994).

Researchers have also attempted to verify Schlesinger's (1966) claim that behavior in office reflects the office-based goals of incumbents. In a detailed analysis of legislative activity and productivity, Herrick & Moore (1993) found that members of the House who sought higher office tended to introduce more bills, make more speeches, propose more amendments and keep larger staffs than their colleagues. Interestingly, they also tended to be less successful in moving legislation through committee and onto the floor. Several studies have compared the voting records of members who ran for higher office to those who did not. Poole & Rosenthal (1997) find that members typically do not change their voting patterns much over the course of a congressional career. Hibbing (1986) found that members did alter their voting behavior in the year just prior to running for the Senate. Carey (1994) similarly found that members moved toward the average position of their state's House delegation in the last term. Francis & Kenny (1996, 2000) argued that members converge instead to the average position of co-partisans from their state. Furthermore, movement begins long before the last term and improves the odds of winning their party's nomination.

5. Conclusion

This brief review of the main approaches to studying political careers supports the following six observations. 1. Though researchers know a great deal about who

politicians are, much less is known about how they got there. 2. In the past two decades, the strategic politicians or "rational-actor" framework emerged as the dominant analytical strategy in career studies. 3. Using individual-level models, researchers have demonstrated that career decision-making is shaped by individual attributes, political institutions, party strength and selection rules, and the electoral setting. 4. In recent years, researchers have developed increasingly sophisticated models to address deficiencies in traditional maximum likelihood procedures. 5. Few attempts have been made to link knowledge of macro-level career patterns and micro-level decision-making processes. 6. As a result, the vast majority of studies ignore previous political experiences, i.e., career paths.

Given the amount of effort that researchers have expended in collecting data on the background and experience of public servants, the failure of recruitment studies to relate individual attributes, including social background, to behavior in office was disappointing. Numerous studies conclusively establish that politicians are different from the people they represent – better educated, wealthier, etc. This descriptive finding has implications for theories of representation. Unfortunately, its generalizability also makes it a poor explanatory variable. If it is true that the attributes of politicians have not changed much, then individual differences cannot be expected to explain large changes in behavior or institutional development. In the cases where attributes have obviously changed, such as the growing numbers of blacks and women elected to public office, researchers have provided modest evidence that these differences matter.

It is interesting that the strategic politicians framework (Jacobson & Kernell 1981) was developed as a way of linking up aggregate-level trends with micro-level

behavior. Subsequently, individual-level models have become the primary strategy for demonstrating that a variety of things of interest to political scientists matter, including political institutions, national political trends and one-time shocks (e.g., the House banking scandal). In this way, studying political careers has become a means to studying something else. Exceptions to this rule include attempts to use individual-level models to explain rising careerism (Brady et al. 1999; Kernell 2003) and efforts to relate progressive ambitions to legislative behavior (Hibbing 1986; Francis & Kenny 1996). The longitudinal structure of many career datasets has also led researchers to develop ever more sophisticated modeling strategies, including event history analysis. In each of these ways, career studies have made valuable contributions.

In the process, however, substantive questions about the basic patterns among careers, and the typical career paths to particular offices, have been shoved aside. The auspicious start made by Schlesinger (1966), who meticulously tracked politicians' movements between offices and related these to aspects of the political opportunity structure, has received little follow-up. The reasons for this are easy to identify. First, the data needed to identify career paths do not exist in a form that can be systematically analyzed. Even the comprehensive dataset compiled by McKibbin (1997) on the U.S. Congress is insufficient for this purpose. To find career paths, researchers need data on the number, type and order of offices occupied. Second, even if such data were available, it is unclear just how a researcher might make sense of it all. Career sequences can be extremely irregular. Until recently, methods for measuring differences among sequences of events were difficult to implement.

Having overcome the current deficiencies in both data collection and methodology, a more basic question remains: *Is there any reason to expect that career sequences matter*? Over the past two decades, researchers have proceeded as if career sequences do not matter. Individual-level models of career decision-making start by breaking up career sequences into a series of choices made by individuals at regular decision points. These choices are treated as independent events generated at each decision point by a stochastic process. Past decisions have no bearing on the present. Where a politician decides to go at any decision point is a function of where she currently sits, and the probabilistic data generating process. If this is an accurate view of the choice process, then whatever is occurring at the aggregate level is irrelevant. Indeed, aggregate-level patterns are simply an artifact of the individual choice process.

Hall & Van Houweling (1995) express this view succinctly in stating that the individual choice process must be understood to fully comprehend the changing patterns in aggregate-level time series. Perhaps this explains why nearly every individual-level model of retirement and ambition published to date fails to include any measure of previous political experience. There are two notable exceptions. Jacobson (1989) includes a measures challenger quality with a simple indicator of whether the individual has held an elective office, and then uses it to predict whether the challenger will be successful in winning a House seat. Kernell (2003) similarly measures commitment to politics with an indicator of whether a member held an elective office prior to being elected to the House. He uses this to predict both the decision to retire and the decision to seek another office. In both studies, previous political experience is a significant predictor of behavior.

The purpose of this review is not to diminish individual-level models or to argue for including a measure of previous elective experience when predicting reelection or retirement. It is to observe that career studies have yet to give an adequate accounting of the different paths that politicians follow to the offices they hold. Simple measures, while an improvement over existing models that largely ignore experience, are unlikely to do the job. Instead, students of political careers need to develop more sophisticated procedures for identifying the basic differences among political careers – the typical and not-so-typical paths to different offices. Do these paths vary among politicians, within offices, across offices or over time? If so, what explains these differences? What consequences do they have for behavior in office or institutional development?

There are ample theoretical reasons to expect that how politicians reach an office will affect what they do while there (Matthews 1984). The challenge going forward is to develop a typology of career paths to particular offices that adequately accounts for differences in previous political experience and can be related to measures of political behavior. It is difficult to identify *a priori* what the relevant paths will be or how they might influence what politicians do. Much of the descriptive work remains to be done. Once finished, the researcher can finally begin to explore the empirical relationships between career sequences – *how they got there* – and political behavior and institutional development – *what they do*. The chapters that follow are an attempt to push this work forward, using newly collected data and sequence analysis methods recently rediscovered by social scientists. These methods are the subject of the next chapter.

Chapter 3

Finding Patterns in Office-Holding Sequences:
Exploratory Methods for Political Career Studies

In the social sciences, many questions concern processes where the ordering or sequence of events makes a difference. Researchers, for example, have argued that nations achieve modernization via a sequence of stages (Rostow 1960; Inglehart & Welzel 2005). Sequence-based explanations have been proposed for the recurrence of critical elections (Mayhew 2000), the cyclical resurgence of racism (Woodward 1966), and the success of presidential regimes (Skowronek 1993). The question of whether events happen in a particular order is especially relevant to the study of careers – whether they occur within industries or organizations, or consist of events leading to criminality, unemployment or other life outcomes. For empirical researchers who study careers, it is critical to identify the basic patterns among career sequences, explain the emergence of these patterns and understand their consequences (Abbott 1995).

For more than two decades, the dominant approach to studying political careers has been to model career sequences as byproducts of a stochastic process. Rather than analyze the patterns among careers or identify the career paths to particular public offices, researchers have turned to models of the individual choice process. Under this approach, the sequence of office-holding events that forms a career is broken up into a series of choices made at regular decision points – e.g., whether to run for reelection or retire from office at the end of a two-year term. Typically, researchers focus on a subset of choices – i.e., those made while serving in a particular office. These choices are

treated as independent observations produced stepwise (one decision at a time) by a stochastic data generating process. More recently, event history techniques have been applied to career data (Jones 1994), whereby each choice is also conditioned on the length of time an individual has spent in a particular office.

For a variety of reasons, the assumptions embedded in individual-level models are likely to be untenable. The choice that individual i makes at decision point t is likely to be affected by choices made prior to t. Furthermore, the likelihood of selecting a particular decision (e.g., running for reelection), depends on both individual characteristics and the timing of the choice.[5] These three assumptions – path independence, homogeneity and stationarity – constitute the necessary conditions of a first-order Markov process (Bartos 1967). Treating political careers as if they are well-described by a first-order Markov process enables the researcher to ignore the pattern question and tap traditional statistical methods – maximum likelihood and event history analysis – in modeling the choice process. Here, the choice that individual i makes at decision point $t+1$ depends only on her circumstances at t (the systematic component) and a probabilistic process that generates choices in a stepwise fashion (the stochastic component).

The alternative to treating the political career as a byproduct of the individual choice process is to analyze whole career sequences. To do so, the researcher requires a set of tools for measuring and making sense of the differences among sequences.

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[5] To date, researchers have focused mostly on relaxing the second assumption, homogeneity. Researchers have added variables measuring differences in individual characteristics, electoral considerations and political institutions. Conceptually, such models resemble the mover-stayer models in sociology that seek to distinguish those likely to move from those most likely to remain indefinitely.

Sequence analysis methods have been developed for precisely this purpose. Sequence analysis generally proceeds in four steps. In the first step, data are coded and formatted as sequences of events, in this case, sequences of office-holding events. In the second step, an algorithm is used to calculate a distance measure for each pair of career sequences. These distances measure differences in the number, type and order of offices occupied. In the third step, the matrix of distances produced by the algorithm is analyzed with exploratory techniques like multi-dimensional scaling or cluster analysis. In the fourth step, the dimensions or groups produced by exploratory techniques are used as independent and dependent variables in statistical analysis.

In the first three steps, the researcher makes choices that give shape to sequence comparison and influence the results that are obtained. In step two, for example, the researcher must decide how to weight the various operations performed by the optimal matching algorithm. In doing so, he essentially defines which events or offices are similar and which are different. In step three, the researcher must choose among the many clustering algorithms to use, and formulate a stopping rule for determining the number of groups in the data. Of the four steps listed above, only the last is likely to be familiar to political scientists. Thus, this chapter provides an introduction to sequence analysis methods, and discusses the choices available to researchers at each step of the process.

This chapter proceeds as follows. The next section gives a brief history of sequence analysis methods and reviews existing social science applications. The third section describes the career data collected for this dissertation and the coding scheme used to arrange this data into sequences of office-holding events. The fourth section

introduces the optimal matching algorithm used to calculate distances for each pair of careers in the dataset. The fifth section demonstrates how multi-dimensional scaling techniques can be used to analyze the matrix of distances produced by the algorithm using a practical example. The sixth section discusses the application of cluster analysis techniques to recover meaningful groups, or career paths, in the data. The final section concludes.

1. Optimal Matching and Its Applications

Sequence analysis refers to a body of methods that take whole sequences of events as units of analysis, rather than treating each event as an individual data point. The problem of measuring the differences among a group of sequences is solved by a dynamic programming technique called optimal matching (OM). OM techniques were first developed by molecular biologists interested in comparing protein and DNA sequences. Computer algorithms for assessing sequence resemblances were invented in the early 1970s (Macindoe & Abbott 2004). By the early 1980s, OM techniques had spread to a variety of applications, including molecular biology, speech recognition and computer science (for a review, see Sankoff & Kruskal 1983). In the 1980s, social scientists began using optimal matching to examine complex sequences of events, including careers of various types.

The first application of OM in the social sciences was by Abbott & Forest (1986), who studied the patterns among Cotswold morris dances performed in 19th century English villages. Each Cotswold village performed its own version of the dance. These dances were conceived and coded as sequences of a finite set of figures. The extent of

the differences in dance sequences across villages was taken as a measure of rural solidarity. Similarly, the stability of the dance sequences within villages over time indicated how these villages were responding to the widespread social and economic changes taking place in the English countryside. Abbott & Forrest (1986) argued that the significant differences they found among the dance sequences suggest a loosely-bound tradition, a finding that belies the conventional view of these dances as an orthodox reaction against change.

Though researchers represent many social processes as sequences of events, the number and variety of social science applications of OM has been limited. Forrest & Abbott (1990) extended their use of OM to study patterns in folktales. Abbott & Barman (1997) examined articles published in the *American Journal of Sociology* to assess the extent to which published work conformed to a single rhetorical formula. The most interesting application of OM to historical data was Abbott & DeViney's (1992) study of the adoption of welfare state programs in 18 developed countries. They find that workers' compensation, unemployment insurance and family allowances programs were almost always adopted in that order, and countries tended to adopt them at the same time. Adoption of health insurance and old age pension programs showed greater variability. Abbott & DeViney found little evidence of policy diffusion, but did have some success relating program adoption to the strength of socialist parties and level of government expenditures.

The most extensive applications of OM have been to career data of various types. Abbott and Hrycak (1990), for example, used OM to analyze the careers of 595 musicians active in Germany between 1660 and 1800. Their analysis yielded a typology

of 20 musical careers. Most of these were dominated by a single type of job (e.g., organist). They found little evidence of hierarchical structure, i.e., orderly succession from low- to high-status jobs. Nor was there much transitioning between courts and churches – the main patrons of German musicians. Macindoe & Abbott (2004) performed a similar analysis of the different career paths leading to private legal practice. They found that the path that lawyers follow to private practice influences both legal workloads and levels of compensation.

Several scholars have used OM to describe changing work patterns or hierarchical structures within organizations. Stovel et al. (1996), for example, used OM to show the transformation from a status-driven to an achievement-based personnel system inside a large British bank. The former system was characterized by individual immobility, with promotion determined mostly by ascriptive traits and the supply of vacancies. The latter system was characterized by high levels of mobility, with individuals serving lengthy apprenticeships before entering management. Carpenter (1996) similarly used OM to document the emergence of bureaucratic culture within the U.S. Department of Agriculture during the late 19th and early 20th centuries. The emergence of distinct career paths within different bureaus of the Department was associated with changes in the length of the civil service career. To my knowledge, Carpenter's study is the only application of OM to political careers.

Other scholars take a broader view of career problems. McVicar & Anyadike-Danes (2002), for example, study the transition from school to the workplace. Using OM, they classify 712 participants from a panel study of young people in Northern Ireland who had recently completed their compulsory education. Their analysis yielded a

typology of five school-to-work transitions, with separate categories dominated by employment, higher education and joblessness. Using a multi-nomial logit procedure, the authors relate their five categories to several causal factors, including individual attributes (e.g., female, Catholic), the home environment (e.g., father unemployed, single-mother household) and educational experience (e.g., grammar school certificate). The authors conduct an extensive sensitivity analysis of their results, illustrating the effects of different coding choices and clustering techniques.

Halpin & Wing Chan (1998) similarly used panel studies – the 1973 Irish Mobility Study and 1991 British Household Panel Study – that contain longitudinal career data. Their focus, however, is on the work-life histories of participants. They classified all jobs into seven broad categories and used OM to discern patterns in work-life histories. Halpin & Wing Chan appears to be the only OM application to employ multi-dimensional scaling techniques – used by the authors to validate the distance matrix returned by the OM algorithm. The results of their analysis are more descriptive than analytical. They find substantial over-time changes in the share of individuals occupying agriculture and unskilled labor tracks, with later cohorts featuring a greater share of individuals in professional and management positions.

This brief review of social science applications of OM illustrates the different problems for which researchers have found sequence analysis methods to be useful (for a detailed review, see Abbott & Tsay 2000). In adapting these methods to particular datasets, researchers have made different choices about how to define and code events, and distinguish which are similar and which are not. Researchers have also used different strategies for grouping similar sequences together, and developed their own

guidelines for determining how many dimensions or clusters reside in their data. In applying sequence analysis techniques to the study of political careers, I have made similar choices with respect to coding and methodological techniques. As in the studies reviewed above, these choices shaped the results that I report in subsequent chapters. The remaining sections describe the choices I made and illustrate how different exploratory techniques can be applied to political career data.

2. Data and Coding

The data used in this study include complete career sequences for nearly 6,000 individuals who held the office of U.S. cabinet member, senator, representative, federal judge, state governor or big city mayor. The primary purpose of collecting this data was to examine career patterns among those holding these different offices. I was also interested in what the main career paths to these various offices looked like and whether they had changed over time. The period of study I chose runs from the Early Republican Era to the beginning of World War II (1809 to 1944). Unfortunately, the costs of collecting career sequences for *all* individuals holding these six high offices were prohibitive. In lieu of compiling a complete census, I identified five historical eras between 1809 and 1944 and collected detailed information on every individual who served in these offices during those eras. Table 3.1 lists the five historical eras chosen for each office and the number of careers they include.

Table 3.1. Career-Year Observations By Office and Era

	1	2	3	4	5	Total
Senate	1810-1824	1848-1860	1868-1878	1894-1926	1930-1940	
Careers	116	132	138	348	124	858
Car.-Yrs.	2376	2267	2588	6756	3013	17000
House	1814-1822	1852-1860	1870-1878	1894-1900	1930-1940	
Careers	477	595	736	540	693	3041
Car.-Yrs.	6837	7456	9854	7998	14798	46943
Cabinet	1809-1828	1849-1860	1869-1881	1893-1912	1928-1944	
Careers	23	36	52	51	37	199
Car.-Yrs.	648	831	1081	813	707	4080
Judges	1809-1828	1849-1860	1866-1879	1893-1912	1928-1944	
Careers	46	37	80	194	254	611
Car.-Yrs.	1108	719	1812	4894	7053	15586
Governors	1814-1829	1849-1860	1867-1881	1890-1910	1930-1940	
Careers	121	146	186	292	139	884
Car.-Yrs.	2405	2535	2958	4621	2427	14946
Mayors	1814-1829	1849-1860	1867-1881	1890-1927	1928-1944	
Careers	21	95	87	141	46	390
Car.-Yrs.	305	1023	989	2192	828	5337
Careers	804	1041	1279	1566	1293	5983
Car.-Yrs.	13679	14831	19282	27274	28826	103892

The decision rule that I used to select individuals into the dataset was straightforward. Individuals were included if they began their tenure in the U.S. cabinet, House, Senate, federal judiciary, or as governor and mayor during any of these five eras. Individuals who did not occupy one of these six offices were excluded. Individuals who occupied an office, but began service prior to the start or after the end dates of particular eras were also excluded. This sampling scheme yielded five cohorts of individuals for each office – 30 cohorts in all. Since each cohort includes all individuals beginning service in an office within a particular era, the sampling scheme allows me to characterize in great detail the political career at five points in U.S. history. Similarly, by collecting information on individuals holding different offices, it is possible to compare career paths within and across offices over time.

The main disadvantage of the sampling scheme described here is that it does not allow the researcher to precisely measure the causes of the career patterns uncovered by the analysis. This is especially true with respect to the effects of political institutions on the careers of individuals within offices over time. To assess the impact of institutions, it is necessary to collect career sequences before and after they change. Because the effects of institutional changes work their way through the political system over time, long pre- and post-intervals are desirable. The historical eras utilized here are insufficient for examining rigorously the impact of many institutions (e.g., ballot reform, primary elections) identified by scholars. Thus, the conclusions I reach about causes will, of necessity, be speculative.

Career data were obtained from biographical directories for each office.[6] To assemble the sequence of office-holding events for each individual, I followed three basic steps. In Step 1, biographical information was transferred from the directories to a FileMaker Pro database file.[7] (Screenshots of the FileMaker Pro interface are reproduced in Appendix I.) The data was entered directly by the author with assistance from a few undergraduate students. Each public office occupied by an individual was entered in the order it was occupied. Start and end dates for each office were recorded along with information about the individual's age, education, non-public occupations, party affiliation and electoral experiences.

In Step 2, public-sector jobs were further assigned one of 20 values from a typology of local, state and federal offices. Table 3.2 reproduces the typology of offices used here. Each office type was given a letter code to distinguish it from other types. Federal law enforcement offices, for example, were all assigned the letter "L." Service in a state legislature is denoted by the letter "R." In Step 3, the sequence of public offices for each individual was constructed by assembling an "office-year string" for every office in the public career. Each string consists of a letter code for the office repeated once for each year the office was occupied. If an individual served in a state legislature for four years, then the string "RRRR" would be added to the sequence. For each individual, the office-year strings were then concatenated in the order of offices occupied to form a final career sequence.

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[6] See references to Chase et al. 1976; Holli & d'A. Jones 1981; Kallenbach & Kallenbach 1982; Treese 1997; and Vexler 1975.
[7] Database programs like Microsoft Access and FileMaker Pro allow coders to design interfaces that use check-boxes, radio buttons, pull-down menus and authentication routines. These tools help minimize typing and other coding errors.

Table 3.2. Classification of Public Sector Jobs

Level	Function			
	ADMINISTRATIVE	EXECUTIVE	JUDICIAL	LEGISLATIVE
FEDERAL	Administrator (F) (*Counsel, FTC*)	President (X)	Federal Judge (J) (*Associate Justice, U.S. Court of Appeals*)	Representative (H)
	Law Enforcement (L) (*U.S. Attorney*)	Cabinet Officer (C) (*U.S. Attorney General*)		Senator (S)
	Diplomat (D) (*Minister to Italy*)			
STATE	Administrator (A) (*Director, State Equalization Board*)	Governor (G)	State Judge (W) (*Chief Justice, Supreme Court of Ohio*)	State Legislature (R)
	Law Enforcement (U) (*District Attorney*)	State Executive (E) (*Secretary of State*)		
LOCAL	Administrator (Q) (*Director, Parks Department*)	Mayor (M)	Local Judge (V) (*Probate Judge*)	City Council (B)
	Law Enforcement (K) (*Police Officer*)	Local Executive (T) (*Deputy Mayor*)		

Note: Letters in parentheses are letter codes used to denote different job types. Positions in italics are examples of the various job types.

The typology of local, state and federal offices shown in Table 3.2 represents the first of several coding choices that shaped the comparison of career sequences. In devising this typology, I was guided by past work on political careers (Schlesinger 1966; Bogue et al. 1976) that classifies public offices by level of government (e.g., local, state, and federal) and the tasks or functions that an individual performs (e.g., administrative, executive, judicial, and legislative). The advantage of such a typology is that it reduces the infinite variety of actual public offices to a small number of basic types. In doing so, however, potentially relevant information is lost. The "Federal-Judicial" category, for example, does not distinguish between district, appeals and Supreme Court justices. Similarly, the "State-Administrative" category is broad, including entry-level civil service employees and high-level administrators with significant policy-making and management responsibilities.

The typology used here would not be appropriate for all studies of political careers. It would, for example, be overly broad for a detailed study of the judicial career. Similarly, it would be entirely useless for an analysis focusing on federal civil service careers. Nonetheless, it is well-suited to the limited purpose of distinguishing the basic differences among the career sequences of individuals serving in the six public offices studied here. In any case, the classification of public offices into types is less important than how the researcher weights the various operations performed by the OM algorithm. Doing the latter requires the researcher to determine which offices are similar and which are different. This important exercise is described in the next section. Thus, the effects of the typology used here are probably minor.

Figure 3.1 shows complete sequences for two governors, James Gillett and John Altgeld. The career sequence for James Gillett combines four office-year strings. Gillett began his political career with a six-year stint as City Attorney of Eureka, California ("KKKKKK"). He then won election to the state senate, where he stayed two years ("RR"). In 1902, he was elected to the U.S. House, serving for three years ("HHH") before becoming Governor of California. He was governor between 1907 and 1911 ("GGGG"), after which he retired to a private legal career. John Altgeld also began his political career in local law enforcement, serving briefly in Andrew County, Missouri during the 1870s ("KK"). He then moved to Illinois and, after failing to win election to the U.S. House in 1884, was elected to the state judiciary. He was a Superior Court judge for five years ("WWWWW"), and became well-known for pardoning three men convicted in the 1886 Haymarket bombing. Altgeld was then elected Governor of Illinois, serving between 1893 and 1897 ("GGGG"). He lost badly in a race for Mayor of Chicago in 1899, effectively ending his political career.

James N. Gillett, California

| K | K | K | K | $\underline{K}$ | $\underline{K}$ | R | R | H | H | H | $\underline{G}$ | $\underline{G}$ | $\underline{G}$ | $\underline{G}$ |

| ϕ | ϕ | ϕ | ϕ | $\underline{K}$ | $\underline{K}$ | W | W | W | W | W | $\underline{G}$ | $\underline{G}$ | $\underline{G}$ | $\underline{G}$ |

John P. Altgeld, Illinois

K = Local Law Enforcement; X = State Judge; H = House; G = Governor; R = State Legislature

Step 1: Insert element K
Step 2: Insert K
Step 3: Insert K
Step 4: Insert K
Step 5: Replace element X with R
Step 6: Replace X with R
Step 7: Replace X with H
Step 8: Replace X with H
Step 9: Replace X with H

Figure 3.1. Alignment of Career Sequences for Two State Governors

The sequences depicted in Figure 3.1 highlight two other additional coding choices that shaped the comparison of career sequences. First, I exclude all private-sector activity in compiling career sequences, even if an individual was privately employed between stints in public service. One reason for doing so is that most directories record information about private-sector activities much less scrupulously. Some entries are incomplete even with respect to the public career. [8] Indeed, for some individuals, it is impossible to determine precise start or end dates for their stints in one

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[8] Given the substantial length and complexity of the career sequences recorded for those serving in the earliest cohort, it does not appear that the entries written about those serving at the beginning of the period are systematically less complete than those serving at the end of the period. Indeed, entries tend to be less complete for those who spent a short time in public office and left no indelible mark on the constituents they served.

or more public offices. [9] Another reason for excluding private-sector activity is that I have little interest in and no theoretical expectations about the extent or character of private-sector activity. Private-sector activity is likely to be more important for some careers (e.g., judges) than others, and its impact certainly warrants further study. Nonetheless, such questions are secondary to the primary objective of this study, which is to understand differences in the political careers of U.S. officeholders.

Second, by repeating the appropriate letter code one time for each year an individual served in an office, I implicitly assume away problems of temporal measurement. Suppose, for example, that two individuals serve in the same three offices in the same order, but the first individual holds each office twice as long as the second. The same causal processes might be at work for both careers, but the pace at which they work varies across careers. Alternatively, suppose that two individuals begin their careers with identical 10-years stints in local law enforcement. The first individual is elected to Congress, but dies after serving a single term. The second goes on to serve another 20 years in Congress. Perhaps the similarities in the first 12 years are more important than the overall disparity in the length of the political career.

Researchers have proposed alternatives to the office-year metric adopted here. Several researchers focus on the episodes (offices) in sequences and ignore issues of temporality. Under this approach, the Gillett sequence depicted in Figure 3.1 would reduce to "KRHG" and the Altgeld sequence would reduce to "KWG." The number,

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[9] Where the biographies specified service in a public office, but did not provide a start or end date for that service, the incumbent was listed as having served in that office for a single year. This practice preserves the correct order of public offices occupied by the incumbent, but probably understates the length of the public career. Thus, the number of career-year observations listed in Table 3.1 actually understates the extent of public service provided by these incumbents.

type and order of offices are considered, but length of service in each is not. Abbott & Hrycak (1990) consider two additional alternatives. The first converts all careers to a pre-specified length, usually 100. Under this approach, the Gillett sequence would consist of "K" repeated 40 times (Gillett's stint in law enforcement accounted for 40 percent of his career), "R" 13.3, "H" 20 and "G" 26.7 times. Here, the assumption is that causal processes operate at equivalent ratios within careers. The second alternative takes the log transformation of the length of time spent in each office. Under this approach, the Gillett sequence would consist of "K" repeated 2.79 times ($\log(6) = 1.79 + 1$ to adjust for one-year stints), "R" 1.69, "H" 2.10 and "G" 2.39 times. Here, disparities in sequence length are important, but much less than in the office-year metric.

One advantage of sequence analysis methods is that they allow the researcher to explore different assumptions about the effects of time. In this respect, they are not wholly unlike event history techniques, where the baseline hazard rate can be represented by a variety of mathematical functions. How the researcher chooses to represent tenure in office in assembling career sequences probably has less impact than assumptions about the baseline hazard rate in event history analysis. Moreover, the theoretical justifications for alternatives to the basic office-year metric are not obvious. Nonetheless, the issue of "time warping" (see Sankoff & Kruskal 1983) warrants more attention than it has received by practitioners. The preliminary analyses performed by Abbott & Hrycak (1990) indicate that different formulations of time can yield interesting and sometimes counterintuitive findings.

3. Optimal Matching

Once the data are formatted into ordered arrays or sequences of events, the differences among them can be explored using optimal matching (OM). As stated above, OM is a dynamic programming technique that solves the problem of measuring the differences in sequential data. In the version of OM used here, two elementary operations are used to transform one sequence into another. The first operation, *replacement*, involves replacing one element with another element. For example, with a simple replacement of the letter "O" for the letter "E," the sequence "PSYCHE" is transformed into "PSYCHO." The second operation, *insertion-deletion*, involves inserting or deleting an element from a sequence. Deleting the letter "G" from "GLOVE" transforms this sequence into "LOVE." Conversely, "LOVE" can be transformed into "GLOVE" with the insertion of the letter "G." Insertion and deletion are essentially equivalent operations and are typically referred to collectively as *indel*.

The distance between two sequences is a function of the number of these elementary operations. When a large number of replacements and indels is required to transform one sequence into another, the sequences are said to be further apart (i.e., more different) than two sequences that require a smaller number of operations. For complex sequences, there is typically more than one way to effect a transformation. Consider the following two sequences of letters: METHODIST and SCIENTIST. Figure 3.2A provides one possible solution for transforming METHODIST into SCIENTIST. It involves replacing the first six letters of the former, M, E, T, H, O, D, with the letters S, C, I, E, N, and T. The last three elements of METHODIST and SCIENTIST are identical and, as such, require no replacements or indels.

Scientist

```
S   C   I   E   N   T   I   S   T
M   E   T   H   O   D   I   S   T
```

Methodist

Step 1: Replace element M with element S
Step 2: Replace E with C
Step 3: Replace T with I
Step 4: Replace H with E
Step 5: Replace D with N
Step 6: Replace D with T

Figure 3.2A. First Possible Alignment of "Methodist" and "Scientist" Sequences

Scientist

```
S   C   I   E   N   T   φ   φ   I   S   T
M   φ   φ   E   T   H   O   D   I   S   T
```

Methodist

Step 1: Replace element M with element S
Step 2: Insert element C
Step 3: Insert I
Step 4: Replace T with N
Step 5: Replace H with T
Step 6: Delete element O
Step 7: Delete D

Figure 3.2B. Second Possible Alignment of "Methodist" and "Scientist" Sequences

Figure 3.2B provides a second solution for transforming METHODIST into

SCIENTIST. This solution involves first replacing M with S. Then, two insertions are

made: C and I. The symbol "ϕ" is used to reserve a spot in one sequence where an insertion is made into the other. An exact match with E is picked up and then followed by two replacements: T with N, H with T. Two deletions, O and D, are made before the transformation is completed by picking up the letters I, S, and T as exact matches. These two solutions for transforming METHODIST into SCIENTIST employ different means to accomplish the same objective.

Is one solution superior? The first uses six steps whereas the second uses seven. If the goal is to find the minimum distance between two sequences, and all replacement and indel operations are weighted equally, the first solution is better. This minimum distance, defined in terms of the number of elementary operations needed transform one sequence into another, is referred to as the edit or Levenshtein distance (Levenshtein 1966). Computer algorithms for calculating Levenshtein distances have been written and are available in standard statistical packages such as R (Buchta & Hahsler 2007) and STATA (Brzinsky-Fay, Kohler & Luniak 2006).

Figures 3.3A and 3.3B illustrate how the minimization process works. The sequence METHODIST is arrayed along a vertical axis; the sequence SCIENTIST is arrayed along the horizontal. To simplify the example, assume that all replacements and indels have a cost of 1, except for exact matches (e.g., replacing a letter with itself), which cost 0. The process begins in the upper left hand cell of the table, (NULL, NULL). From this cell, the program can move one cell to the right (NULL, S) by making an insertion (of S). The cost of the insertion, in this case 1, is displayed in the lower-left corner of the cell. The program could, alternatively move one cell down by making a deletion (of M), from (NULL, NULL) to (M, NULL). The cost of the deletion, also 1, is

displayed in the upper-right corner of the cell. Finally, the program could move
diagonally, from (NULL, NULL) to (M, S), by replacing M with S. The cost of making
this replacement, 1, is displayed in the upper-left corner.

	Null	S	C	I	E	N	T	I	S	T
Null	0	1 1	1 2	1 3	1 4	1 5	1 6	1 7	1 8	1 9
M	1 / 1	1 1 / 1 1	1 1 / 1 2	1 1 / 1 3	1 1 / 1 4	1 1 / 1 5	1 1 / 1 6	1 1 / 1 7	1 1 / 1 8	1 1 / 1 9
E	1 / 2	1 1 / 1 2	1 1 / 1 2	1 1 / 1 3	0 1 / 1 3	1 1 / 1 4	1 1 / 1 5	1 1 / 1 6	1 1 / 1 7	1 1 / 1 8
T	1 / 3	1 1 / 1 3	1 1 / 1 3	1 1 / 1 3	1 1 / 1 4	1 1 / 1 4	0 1 / 1 5	1 1 / 1 6	1 1 / 1 7	1 1 / 1 8
H	1 / 4	1 1 / 1 4	1 1 / 1 4	1 1 / 1 4	1 1 / 1 4	1 1 / 1 5	1 1 / 1 5	1 1 / 1 6	1 1 / 1 7	1 1 / 1 8
O	1 / 5	1 1 / 1 5	1 1 / 1 5	1 1 / 1 5	1 1 / 1 5	1 1 / 1 5	1 1 / 1 6	1 1 / 1 6	1 1 / 1 7	1 1 / 1 8
D	1 / 6	1 1 / 1 6	1 1 / 1 6	1 1 / 1 6	1 1 / 1 6	1 1 / 1 6	1 1 / 1 6	1 1 / 1 7	1 1 / 1 7	1 1 / 1 8
I	1 / 7	1 1 / 1 7	1 1 / 1 7	0 1 / 1 6	1 1 / 1 7	1 1 / 1 7	1 1 / 1 7	0 1 / 1 6	1 1 / 1 7	1 1 / 1 8
S	1 / 8	1 1 / 1 8	1 1 / 1 8	1 1 / 1 7	1 1 / 1 7	1 1 / 1 8	1 1 / 1 8	1 1 / 1 7	0 1 / 1 6	1 1 / 1 7
T	1 / 9	1 1 / 1 9	1 1 / 1 9	1 1 / 1 8	1 1 / 1 8	1 1 / 1 8	1 1 / 1 9	1 1 / 1 8	1 1 / 1 7	0 1 / 1 6

Note: Numbers in upper-left corners indicate the cost of entering the cell via replacement (from up-left).
Numbers in lower-left and upper-right corners indicate cost of entering via insertion (from left) and
deletion (from above). Numbers in lower-right corners indicate the minimum cost of reaching the cell.

Figure 3.3A. Minimization Through Optimal Matching, Solution 1

The number displayed in the lower-right corner of each cell indicates the
minimum cost of reaching the cell. In this case, it represents the minimum number of
operations needed to reach the particular box. The minimum cost of reaching (M, S) is 1,
achieved by moving into the cell from the upper-left (NULL, NULL) via replacement.
One could also reach this cell by deleting S and inserting M, or by inserting M and then
deleting S. Both paths, however, entail a cost of 2, which is greater than the cost of

entering directly via replacement. In this case, there is only one way to reach (M, S) *and* achieve the minimum cost of 1. In many instances, there are multiple paths to a given cell that enable the program to achieve the minimum cost. One can achieve the minimum cost of reaching the cell (T, E), for example, in two ways. The first solution involves replacing M with S, E with C, T with I, and then inserting E. The second solution involves replacing M with S, inserting C and I, picking up the exact match with E, and then inserting T. Both solutions entail a cost of 4.

Each cell shows its four corner values in the form **TL TR / BL BR** (TL = replacement/up-left, TR = deletion/above, BL = insertion/left, BR = minimum/lower-right).

	Null	S	C	I	E	N	T	I	S	T
Null	0	1 1	1 2	1 3	1 4	1 5	1 6	1 7	1 8	1 9
M	1 / 1	1 1 / 1 1	1 1 / 1 2	1 1 / 1 3	1 1 / 1 4	1 1 / 1 5	1 1 / 1 6	1 1 / 1 7	1 1 / 1 8	1 1 / 1 9
E	1 / 2	1 1 / 1 2	1 1 / 1 2	1 1 / 1 3	0 1 / 1 3	1 1 / 1 4	1 1 / 1 5	1 1 / 1 6	1 1 / 1 7	1 1 / 1 8
T	1 / 3	1 1 / 1 3	1 1 / 1 3	1 1 / 1 3	1 1 / 1 4	1 1 / 1 4	0 1 / 1 5	1 1 / 1 6	1 1 / 1 7	1 1 / 1 8
H	1 / 4	1 1 / 1 4	1 1 / 1 4	1 1 / 1 4	1 1 / 1 4	1 1 / 1 5	1 1 / 1 5	1 1 / 1 6	1 1 / 1 7	1 1 / 1 8
O	1 / 5	1 1 / 1 5	1 1 / 1 5	1 1 / 1 5	1 1 / 1 5	1 1 / 1 5	1 1 / 1 6	1 1 / 1 6	1 1 / 1 7	1 1 / 1 8
D	1 / 6	1 1 / 1 6	1 1 / 1 6	1 1 / 1 6	1 1 / 1 6	1 1 / 1 6	1 1 / 1 6	1 1 / 1 7	1 1 / 1 7	1 1 / 1 8
I	1 / 7	1 1 / 1 7	1 1 / 1 7	0 1 / 1 6	1 1 / 1 7	1 1 / 1 7	1 1 / 1 7	0 1 / 1 6	1 1 / 1 7	1 1 / 1 8
S	1 / 8	1 1 / 1 8	1 1 / 1 8	1 1 / 1 7	1 1 / 1 7	1 1 / 1 8	1 1 / 1 8	1 1 / 1 7	0 1 / 1 6	1 1 / 1 7
T	1 / 9	1 1 / 1 9	1 1 / 1 9	1 1 / 1 8	1 1 / 1 8	1 1 / 1 8	1 1 / 1 9	1 1 / 1 8	1 1 / 1 7	0 1 / 1 6

Note: Numbers in upper-left corners indicate the cost of entering the cell via replacement (from up-left). Numbers in lower-left and upper-right corners indicate cost of entering via insertion (from left) and deletion (from above). Numbers in lower-right corners indicate the minimum cost of reaching the cell.

Figure 3.3B. Minimization Through Optimal Matching, Solution 2

The minimum cost solution of transforming METHODIST into SCIENTIST is solution 1, which is highlighted in gray in Figure 3.3A. Figure 3.3B depicts solution 2.

While both sets of operations successfully execute the desired transformation, solution 1 does so at lower cost (6 instead of 7). OM uses the Needleman-Wunsch algorithm (Needleman & Wunsch 1970) to find the least cost solution, given the penalties assigned by the researcher to various replacement and indel operations. In this case, all replacement and indel operations were assigned a cost of 1. The OM algorithm does allow the researcher to distinguish between replacements and assess different costs for replacements and indels. Since any replacement can be achieved via one deletion and one insertion, setting the cost of indels at less than half of replacements will ensure that the algorithm uses only indels in effecting a transformation. Similarly, if a replacement cost is more than twice the indel cost, the algorithm will choose an indel combination over replacement.

The various costs of replacements and indels are assembled in a matrix of substitution costs. In setting costs, researchers must rely on their substantive knowledge of the subject matter. While the absolute magnitude of the costs does not matter, the relative costs of replacement and indel operations give structure to sequence comparison. OM is an exploratory tool. Used properly, it can illustrate patterns in sequence data that are difficult to find through traditional methods. Like all statistical methods in the social sciences, however, the tools of sequence analysis are no substitute for detailed knowledge of the phenomenon being studied. The rest of this section illustrates the assignment of substitution costs using a simple example.

3.1 Substitution Costs

Setting substitutions costs is the central theoretical exercises in sequence analysis. For each possible pair of elements – i.e., offices – the researcher has to decide whether to impose a penalty for replacing one element with the other. Typically, all replacements have some positive cost, unless the two elements are identical. If a penalty is imposed, the researcher has to decide how large it will be relative to penalties for other replacements. In general, a penalty ought to be large if the elements are very different from each other. In addition, the researcher has to decide what penalty to assess when an element has to be inserted or deleted from a sequence. The size of the indel penalty shapes how the OM algorithm will treat sequences of very different lengths. Setting indel penalties low prevents the calculation of distances from being overwhelmed by large disparities in sequence length.

Empirical researchers have taken different approaches to setting substitution costs. Dijkstra & Taris (1995), for example, refused to distinguish among possible replacement and indel operations. Other researchers have used observed transition rates to assign costs between events (Rohwer & Potter 2005). Two events are said to be very different from each other if the observed probability of moving from one to the other is small. In this case, the replacement penalty would be set high. This approach has several drawbacks. First, observed transition rates reflect initial distributions of offices and officeholders as well as the costs of making individual transitions. Replacement penalties for extremely rare transitions can unduly affect the minimization process. Second, for many applications, it might be unclear whether observed data adequately represent the true transition probabilities. Finally, it is possible that observed transition rates will vary

over a period of study. Neither the agnostic solution (all replacement penalties are equal) nor the empirically-driven method is particularly appealing here.

Fortunately, criteria for distinguishing the elements or events that form a career are usually fairly obvious. Abbott & Hrycak (1990), for example, distinguish transitions between court and church sectors by setting higher penalties for replacements that involve court- and church-related jobs. Similarly, Halpin & Wing Chan (1998) grouped occupations under seven categories representing different social classes. They adopted a rule of thumb whereby replacements penalties were higher for exchanges between classes than for exchanges within classes. Based on past studies of political careers (Schlesinger 1966; Bogue et al. 1976), which distinguish public offices by level of government and the tasks or functions that an incumbent performs, I classified all public offices under the 20 job types in Table 3.2.

Like a Halpin & Wing Chan (1998), I adopt a rule of thumb whereby replacements that exchange one level of government with another are more costly than those that require no such exchanges. Similarly, replacements that exchange one job function for another are more costly than those that require no such exchanges. Replacements that exchange both one level of government for another and one job function for another are the most costly of all. Specifically, I adopted the following substitution rules:

1. Any two public offices that have identical job types can be substituted for each other without penalty. "Judge, U.S. District Court" and "Associate Justice, U.S. Supreme Court" are two public offices that fall under the "Federal Judge" job type. Replacing "J" with "J" would incur a penalty of zero.

2. Any replacement that exchanges one job type for another job type is assessed a penalty of 1.0. "U.S. Attorney" and "U.S. Minister to Italy" are two public offices that fall under different job types ("Federal Law Enforcement" and "Federal Diplomat"). Replacing "F" with "D" would incur a penalty of 1.0.

3. Any replacement that exchanges 1. a federal with a state job, 2. a federal with a local job, or 3. a state with a local job is assessed an additional penalty of 1.0. "State Representative" and "U.S. Senator" are two public offices that fall under different levels of government ("State" and "Federal"). Replacing "R" with "S" would incur a penalty of 2.0.

4. Any replacement that exchanges one job function with another is assessed an additional penalty of 1.0. "Member, City Council" and "Mayor" are two public offices that fall under different job functions ("Legislative" and "Executive"). Replacing "B" with "M" would incur a penalty of 2.0.

5. By implication, any replacement that exchanges both one level of government for another and one job function is assessed the maximum penalty. "Probate Judge" and "U.S. Secretary of State" are two public offices that fall under different levels of government ("Local" and "Federal") and different job functions ("Judicial" and "Administrative"). Replacing "V" with "C" would incur a penalty of 3.0.

These replacement penalties are assembled in the substitution cost matrix depicted in Figure 3.4.

	X	C	J	F	D	L	H	S	G	E	W	A	U	R	M	T	V	Q	K	B
X	0	1	2	2	2	2	2	2	2	2	3	3	3	3	2	2	3	3	3	3
C	1	0	2	1	1	1	2	2	2	2	3	2	2	3	2	2	3	2	2	3
J	2	2	0	2	2	2	2	2	3	3	2	3	3	3	3	3	2	3	3	3
F	2	1	2	0	1	1	2	2	3	2	3	2	2	3	3	2	3	2	2	3
D	2	1	2	1	0	1	2	2	3	2	3	2	2	3	3	2	3	2	2	3
L	2	1	2	1	1	0	2	2	3	2	3	2	2	3	3	2	3	2	2	3
H	2	2	2	2	2	2	0	1	3	3	3	3	3	2	3	3	3	3	3	2
S	2	2	2	2	2	2	1	0	3	3	3	3	3	2	3	3	3	3	3	2
G	2	2	3	3	3	3	3	3	0	1	2	2	2	2	2	2	3	3	3	3
E	2	2	3	2	2	2	3	3	1	0	2	1	1	2	2	2	3	2	2	3
W	3	3	2	3	3	3	3	3	2	2	0	2	2	2	3	3	2	3	3	3
A	3	2	3	2	2	2	3	3	2	1	2	0	1	2	3	2	3	2	2	3
U	3	2	3	2	2	2	3	3	2	1	2	1	0	2	3	2	3	2	2	3
R	3	3	3	3	3	3	2	2	2	2	2	2	2	0	3	3	3	3	3	2
M	2	2	3	3	3	3	3	3	2	2	3	3	3	3	0	1	2	2	2	2
T	2	2	3	2	2	2	3	3	2	2	3	2	2	3	1	0	2	1	1	2
V	3	3	2	3	3	3	3	3	3	3	2	3	3	3	2	2	0	2	2	2
Q	3	2	3	2	2	2	3	3	3	2	3	2	2	3	2	1	2	0	1	2
K	3	2	3	2	2	2	3	3	3	2	3	2	2	3	2	1	2	1	0	2
B	3	3	3	3	3	3	2	2	3	3	3	3	3	2	2	2	2	2	2	0

Note: Offices for each letter code listed in Table 3.2.

Figure 3.4. Matrix of Substitution Costs

The assumptions contained in this list of replacement penalties are not likely to be met in the real world. Term lengths and regular elections, for example, make it harder to persist in an elective than appointed office. Similarly, empirical research suggests that transition probabilities between office pairs are likely to be asymmetric in most cases. Moving from the U.S. House to a state legislature is easier than a state legislature to House transition. Some assumptions, however, are necessary to structure the OM algorithm so that it produces meaningful distances for analysis. As discussed above, sequence analysis is an exploratory tool and the efficacy of any assumptions about substitution costs must be weighed against the results they produce.

In addition to the replacement penalties summarized above, each indel operation was assessed a penalty of 1.5, or one-half the size of the largest penalty. Setting the indel penalty too low effectively renders the replacement penalties superfluous since any replacement can be achieved with one deletion and one insertion. Setting the indel penalty too high, however, would allow disparities in the length of the political career to unduly affect the calculation of distances. Indeed, to account for these disparities, most OM applications standardize the raw distances produced by the OM algorithm by dividing by the length of the longest sequence in the dataset or, for each pairwise comparison, the length of the longer sequence. In the chapters that follow, I standardize the raw distances by dividing by the length of the longest political career in the dataset.

The effects of these various assumptions can be illustrated using a simple example. Table 3.3 contains three inter-sequence distance matrices for six U.S. Senate careers chosen randomly from the dataset. Each sequence is described by the string of numbers and letters in the left-hand column. Each letter denotes an office; the number

preceding it indicates how long the individual spent there (e.g., 16R1G10S3C1D = 16 years of state legislative service followed by 1 year as governor, 10 years in the Senate, three in the Cabinet and one in diplomatic service). Each distance matrix has 15 unique distances in it, calculated under different indel penalties. In panel 3.3A, for example, the distance between each pair of careers is calculated using the penalties described above. In panel 3.3B, I impose a lower penalty of .75 for each indel operation. In panel 3.3C, I impose a higher penalty of 2.25 for each indel operation.

The effect of these different indel penalties can be seen by looking at the distance between careers 1 and 5. These two senate careers have the largest disparity in length – 25 years. In panel 3.3A, the standardized distances between these two is 1.2097. In panel 3.3B, which recalculates the distance using a lower indel penalty, the distance is .6048. In panel 3.3C, which recalculates the distance using a higher indel penalty, the distance is 1.8145. In addition to changing the size of the distances, these different indel penalties can also change their ordinal ranking. In panel 3.3A, the distance between careers 1 and 5 is the second-largest in the matrix. In panel 3.3B, it is the fourth largest. In panel 3.3C, it is the largest by far.

Table 3.3. Inter-Sequence Distances Under Varying Insertion / Deletion Penalties

Sequence		*A. Standard Substitution, Indel Penalties*					
16R1G10S3C1D	1						
1U3V1R10S3R	2	1.2742					
5R1A3W4G12S	3	.8710	.8548				
2R6H4S3G	4	1.1613	.5968	.9677			
6S	5	1.2097	.5806	.9194	.5000		
3U4W12S	6	1.1613	.5323	.5156	.8065	.6290	
		1	2	3	4	5	6

Sequence		*B. Standard Substitution, Low Indel Penalties*					
16R1G10S3C1D	1						
1U3V1R10S3R	2	.6532					
5R1A3W4G12S	3	.5806	.5081				
2R6H4S3G	4	.7258	.4597	.5806			
6S	5	.6048	.2903	.4597	.2823		
3U4W12S	6	.7258	.3629	.3226	.5323	.3145	
		1	2	3	4	5	6

Sequence		*C. Standard Substitution, High Indel Penalties*					
16R1G10S3C1D	1						
1U3V1R10S3R	2	1.5887					
5R1A3W4G12S	3	1.0161	1.0726				
2R6H4S3G	4	1.5484	.6694	1.2419			
6S	5	1.8145	.8710	1.3790	.7177		
3U4W12S	6	1.4516	.6048	.6613	.9516	.9435	
		1	2	3	4	5	6

Note: Labels in sequence column denote career sequences. So, for example, "2R6H4S3G" denotes 2 years of state legislative service followed by 6 years of House service, 4 years of Senate service and 3 years of gubernatorial service. Letter codes the same as in Table 3.2. All distances calculated with 1.0 penalty for replacement of one job type with another, 1.0 penalty for replacement of one level of government with another and 1.0 penalty for replacement of one job function with another. Distances under standard substitution costs calculated with 1.5 penalty, low indel costs calculated with .75 penalty, and high indel costs calculated with 2.25 penalty for each indel operation.

Interestingly, the effects of the various assumptions used to distinguish the

different public offices appear to be less important. Table 3.4 contains three inter-

sequence distance matrices calculated using variations of the replacement penalties

described above. Panel 3.4A recalculates the distances without the additional

replacement penalties for changes in level of government or job function. Panel 3.4B

recalculates the distances with the additional penalty for changes in job function, but

without the additional penalty for changes in level of government. Panel 3.4C

recalculates the distances with the additional penalty for changes in level of government,

but without the additional penalty for changes in job function. The distance between

careers 1 and 5 does not change at all, ostensibly because the transformation of "6S" into

"16R1G10S3C1D" is achieved mostly through indel rather than replacement operations.

Transformations that require more replacement operations, such as between careers 1 and

2, show greater fluctuation in the resulting distances.

Table 3.5 reports correlation coefficients calculated for each pair of the six inter-

sequence distance matrices in Tables 3.3 and 3.4. With one exception, the Pearson's

correlation coefficients are above .90, indicating substantial stability in the size of the

distances under different replacement and indel penalties. Given the potential importance

of the substitution cost matrix, researchers ought to explore different replacement and

indel penalties. The replacement penalties reflect the researcher's understanding of the

similarities among a set of elements, in this case, public offices. The indel penalties

determine how the OM algorithm will treat sequences that have large disparities in

length. In the chapters that follow, I use the standard replacement and indel penalties

described above. These cost assumptions are, I believe, theoretically defensible and

grounded in past empirical work. They represent decent first approximations of the costs

associated with making transitions between the various public offices available in the

U.S. federal system.

Table 3.4. Inter-Sequence Distances Under Varying Substitution Penalties

Sequence		*A. No Level, Function Penalties*					
16R1G10S3C1D	1						
1U3V1R10S3R	2	.8548					
5R1A3W4G12S	3	.5806	.5968				
2R6H4S3G	4	1.0645	.4677	.7742			
6S	5	1.2097	.5806	.9194	.5000		
3U4W12S	6	.8710	.3065	.4194	.5484	.6290	
		1	2	3	4	5	6

Sequence		*B. No Level Penalties*					
16R1G10S3C1D	1						
1U3V1R10S3R	2	1.0806					
5R1A3W4G12S	3	.8710	.6935				
2R6H4S3G	4	1.0645	.5968	.8710			
6S	5	1.2097	.5806	.9194	.5000		
3U4W12S	6	1.0968	.3710	.5161	.7419	.6290	
		1	2	3	4	5	6

Sequence		*C. No Function Penalties*					
16R1G10S3C1D	1						
1U3V1R10S3R	2	1.0484					
5R1A3W4G12S	3	.5806	.7903				
2R6H4S3G	4	1.1613	.4677	.9032			
6S	5	1.2097	.5806	.9194	.5000		
3U4W12S	6	.8710	.5000	.4194	.6774	.6290	
		1	2	3	4	5	6

Note: Labels in sequence column denote career sequences. So, for example, "2R6H4S3G" denotes 2 years of state legislative service followed by 6 years of House service, 4 years of Senate service and 3 years of gubernatorial service. Letter codes the same as in Table 3.2. All distances calculated with 1.5 penalty for each indel operation and 1.0 penalty for replacement of one job type with another.

The OM algorithm performed the procedure depicted in Figure 3.3A for every pairwise combination of career sequences (17,895,153 pairwise combinations!). This

constitutes a hefty calculating exercise.[10] The algorithm returned a matrix of distances

that captures differences in the political careers of all 5,983 individuals in the dataset. In

the chapters that follow, I use these distances in various ways. For some analyses, I focus

on the career paths leading to one or more public offices. In this case, the OM algorithm

calculates distances for that part of the sequence that occurs prior to service in the

particular office. Because career sequences vary substantially in length, the raw distances

are heavily influenced by disparities in sequence length. The potential distance between

a short and long sequence is greater than for two sequences of equal length (Brzinsky-

Fay, Kohler & Luniak 2006). I correct for this problem in all of the analyses that follow

by dividing each pairwise distance by the length of the longest sequence among the

subset of careers being compared.

Table 3.5. Correlation Tests for Six Substitution Cost Matrices

Penalties							
Standard Indel	3A						
Low Indel	3B	.9689					
High Indel	3C	.9825	.9167				
No Level, Function	4A	.9452	.8760	.9848			
No Level	4B	.9875	.9516	.9857	.9676		
No Function	4C	.9700	.9094	.9878	.9776	.9605	
		3A	3B	3C	4A	4B	4C

Note: Labels in penalties column denote the different assumptions about indel and replacements
summarized in Tables 3.3 and 3.4. Figures in the table represent Pearson's product-moment correlations.
All coefficients are significant at the .001 level.

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[10] Indeed, because the size of this distance matrix exceeds the storage capacities of the R statistical
package, it was necessary to perform these calculations in a piecewise fashion.

The distances returned by the OM algorithm form the input for exploratory data analysis procedures, such as multi-dimensional scaling and cluster analysis. These techniques enable the researcher to recover relevant dimensions or groupings in the data. Some researchers have also found the distances themselves to be informative. Abbott & Forest (1986), for example, calculate average inter-sequence distances for four distinct dance types and several historical periods. They perform t-tests on the between- and within-group distances to detect clustering within dance types and historical periods. In Chapter 5, I perform a similar analysis to assess whether the path to the mayor's office differed across cities. For the most part, however, the underlying clusters and dimensions are difficult to discern from the distance matrix. More sophisticated procedures are needed. The next two sections demonstrate how multi-dimensional scaling and cluster analysis techniques can be used for this purpose.

4. Multi-dimensional Scaling and Career Spaces

Scaling techniques help researchers to analyze large arrays of data and detect hidden patterns within them. Researchers have used scaling techniques profitably to study very different political behaviors. Weisberg (1972) and Poole & Rosenthal (1997, 2006), for example, used scaling techniques to analyze roll-call voting in the U.S. Congress. Aldrich & McKelvey (1977) developed a scaling program to study voters' perceptions of presidential candidates. Jacoby & Francis (1985) developed a novel scaling procedure to detect structure in the locus of decision-making among the 99 state legislatures in the United States.

Multi-dimensional scaling (MDS) techniques can be particularly helpful when the data being studied are theoretically amorphous (Borg & Groenen 2005). While much progress has been made in understanding careers of various types, researchers lack an explicit theory that would predict patterns among career sequences or the magnitude of inter-sequence distances. MDS techniques allow the researcher to empirically address several practical and substantive questions. On the practical side, the researcher wants to know whether the substitution costs used in sequence analysis produce a coherent or meaningful space. Substantively, MDS allows the researcher to determine whether careers map into a low-dimensional space and, if they do, what the most salient dimensions are.

MDS techniques attempt to represent the differences among a given set of observations by distances among the points of an m-dimensional configuration – the MDS space (Borg & Groenen 2005). To illustrate how MDS techniques can be used to analyze the inter-sequence distances returned by the OM algorithm, I ran the career sequences for 611 federal judges through the non-metric MDS program developed by Kruskal (1964b).[11] The program returns coordinates for each observation that allows the researcher to plot them in a m-dimensional space. For the one-dimensional solution, the coordinates correspond to locations on a number line. For the two-dimensional solution, the coordinates correspond to a point in the x-y plane. For the three-dimensional solution, the coordinates correspond to a three-dimensional shape or surface. Beyond three dimensions, visual inspection becomes difficult.

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[11] Non-metric or ordinal MDS differs from metric or ratio MDS in the following way. In metric MDS, the ratios of the distances in the MDS space reflect the magnitude of the actual distances. In non-metric MDS, the representation of the distances in the MDS space reflects the order of the distances only. Ratio and ordinal MDS solutions are almost always very similar in practice (Borg & Groenen 2005).

Figure 3.5 contains scatterplots for the three-dimensional solution. The identify function in R allowed me to look at individual data points, simplifying the identification of dimensions. In each panel, five career sequences are identified for illustrative purposes. Panel 3.5B plots the coordinates for the first two principal dimensions. In this representation, the judicial careers are arrayed along a horizontal line (dimension 1), with careers featuring short stints in judicial service on the left and those with lengthy tenures on the right. The second dimension distinguishes careers that have a substantial state component and those with a substantial federal component. Panel 3.5A plots the coordinates for the first and third principal dimensions. The third dimension reveals a local component to judicial careers, with those featuring long stints in a local public office (usually local judge) arrayed along the bottom. Panel 3.5C plots the coordinates for the second and third dimensions.

A. Dimensions 1 and 3

B. Dimensions 1 and 2

C. Dimensions 2 and 3

Note: Labels denote career sequences for the nearest data point. So, for example, "24H26J" denotes 24 years of House service followed by 26 years of federal judicial service. Letter codes the same as in Table 3.2.

Figure 3.5. Non-Metric MDS Representation of Judicial Careers, 1809-1944

The results of the three-dimensional solution are encouraging. The inter-sequence distances produced by the OM algorithm map onto a MDS space where the most salient dimensions are readily interpretable. Substantively, however, it would be desirable to know how well MDS, which maps actual inter-sequence distances – call them proximities – into corresponding distances of an MDS space. To assess model fit, researchers have developed the concept of stress. The error of representation, defined by

$$e_{ij}^2 = [\, f(p_{ij}) - d_{ij}(\mathbf{X})\,]^2$$

where p_{ij} is the proximity for individuals i and j, f is any monotonic function, and $d_{ij}(\mathbf{X})$ is the Euclidean distance between individuals i and j in a m-dimensional configuration $\mathbf{X}$. The raw stress of a MDS representation is calculated by summing e_{ij}^2 over all pairs of individuals. Because the magnitude of raw stress values are scale dependent, it is typically weighted by the sum of the squared distances in the MDS representation, $\Sigma\, d_{ij}^2(\mathbf{X})$. This number tends to be small in practice. Kruskal (1964a) proposed the following formula

$$\text{Stress-1} = \sigma^1 = [\, \sum\, [\, f(p_{ij}) - d_{ij}(\mathbf{X})\,]^2\, /\, \sum\, d_{ij}^2(\mathbf{X})\,]^{.5}$$

Stress-1 can be understood as a measure of a solution's badness-of-fit.

Minimizing Stress-1 requires finding an optimal configuration ($\mathbf{X}$) for a given dimensionality, m. In non-metric MDS, researchers have demonstrated that any matrix of proximities, p_{ij}, can be represented with zero stress in $m = n - 2$ dimensions, where n is the number of data points (Borg & Groenen 2005). Such solutions are not particularly desirable. Ideally, the researcher would like a solution that economizes on dimensions, but does not distort the true MDS structure. Kruskal (1964a) suggested that a good

solution is one for which further increases in the number of dimensions, *m*, do not lead to significant decreases in stress. To find that optimal *m*, the researcher must compute stress values for different dimensionalities and plot them against the number of dimensions.

Figure 3.6 plots σ^1 for different values of *m*. Not surprisingly, increasing the number of dimensions tends to reduce stress. However, after the third or fourth dimension, further increases in *m* do not lead to significant decreases in stress. The value of σ^1 decreases from 25.86 to 19.01 with the addition of a third dimension. Adding a fourth dimension reduces σ^1 to 13.52. The value of σ^1 for the six-dimensional solution, 9.88, is only slightly smaller. Unfortunately, the stress diagram does not have a sharp elbow at any point, which would constitute strong evidence for a particular solution. Nonetheless, the lack of improvement in the MDS representation after three or four dimensions does suggest the presence of significant structure in the data.

Figure 3.6. Stress Values for Judicial Careers, 1809-1944

5. Cluster Analysis of Pre-Cabinet Careers

Cluster analysis techniques are used to assign observations to homogenous groups in large datasets. These groups can be used for descriptive purposes or as independent and dependent variables in statistical analysis. When used in tandem with OM, they enable researchers to partition a large number of complex sequences into a small number of groups or clusters. Researchers have applied cluster analysis techniques to a variety of settings, including datasets compiled by archaeologists, economists, psychologists and sociologists (Everitt 1983). Political scientists have used such techniques more sparingly. Several researchers have used clustering to distinguish groups of respondents in public opinion surveys. MacRae (1966) used a cluster analysis procedure to identify voting

blocs in the U.S. Congress. Wolfson et al. (2004) used cluster analysis to group states with similar economic and political settings.

Cluster analysis can be particularly helpful in studying careers, where researchers are interested in describing career trajectories or the routes that individuals follow to particular jobs or outcomes. For political careers, researchers are especially interested in whether there are distinct paths to particular public offices (Matthews 1954). Hierarchical cluster analysis procedures utilize measures of dissimilarity – in sequence analysis, the inter-sequence distances returned by the OM algorithm – to build a hierarchy of clusters that summarize any structure in the data. Under the agglomerative clustering approach used here, the analysis begins with each observation in its own cluster. The clustering algorithm successively links or joins observations until a single cluster is reached containing all observations.

Researchers have proposed several criteria for linking observations at each step in the analysis. Unfortunately, different algorithms can yield slightly different partitions of the data. Under the single-linkage or "nearest-neighbor" algorithm, for example, the two clusters with the least distance between them are joined at each step. Unfortunately, this method is vulnerable to chaining, whereby clusters are forced together if two of their elements are close to each other, even though other elements in the clusters are far apart. Researchers have developed modified algorithms that attempt to find clusters that are compact and spherical in shape. One such algorithm is Ward's method (Ward 1963). At each joining of one observation or group with another, Ward's method attempts to minimize the loss of information that results. Each possible pair of clusters is considered;

the procedure selects the cluster that minimizes the error sum of squares defined by the following formula:

$$ESS = \sum_{i=1}^{n}(x_i - x_{mean})^2$$

This error sum of squares criterion distinguishes Ward's method from other agglomerative clustering techniques (Everitt 1993).

To illustrate how cluster analysis techniques can be used to analyze the inter-sequence distances returned by the OM algorithm, I used Ward's method to analyze the careers of 199 individuals who served in the U.S. cabinet between 1809 and 1944. To assess whether these individuals follow similar paths to the office, only that part of the career sequence that occurs prior to cabinet service was analyzed. The program returned group indicators for all *n* - 1 cluster solutions. The hierarchy of clusters identified by the procedures is depicted by the dendrogram in Figure 3.7. A dendrogram is a tree diagram that illustrates the arrangement of clusters, i.e., the successive joining of observations and clusters. The labels describe the career paths for the two-, three-, four-, five- and six-group solutions.

Figure 3.7. Dendrogram of Pre-Cabinet Careers

One drawback of cluster analysis techniques is that they do not indicate what the optimal number of groups is for the data being analyzed. Indeed, some algorithms require the researcher to stipulate a desired number of clusters *a priori*. Scholars have devised several techniques to assist in the selection of the optimal number of groups. These are usually referred to as stopping rules (Everitt 1993). Ultimately, whether a four-group solution is superior to a three-group solution, for example, is a subjective judgment that the researcher must make. As with the problem of determining the costs of various replacement and indel operations discussed above, there is no substitute for detailed knowledge of the subject matter being investigated.

In selecting the number of clusters, the analyst confronts two types of decision error. The first type occurs when a stopping rule produces a k-cluster solution when less than k groups are actually present. The second kind of error occurs when the stopping rule yields fewer clusters than are actually present. Of the two errors, the second is more serious in applied settings. Here, the merging of distinct clusters results in a loss of information. Of the various stopping rules proposed by statisticians, the Calinski-Harabasz (1974) pseudo-F index has gained wide acceptance, outperforming many other measures in Monte Carlo studies (Milligan & Cooper 1984). The index is computed by

$$[\text{ trace } B / (k-1)] / [\text{ trace } W / (n-k)]$$

where n is the number of objects, k is the number of clusters, B is the between-cluster sum of squares and W is the within-cluster sum of squares. Larger values of the statistic indicate more distinct clustering.

**Table 3.6. Calinski-Harabasz Statistics for
Pre-Cabinet Cluster Solutions**

Number of Groups	Calinski-Harabasz pseudo-F
2	82.40
3	63.72
4	68.44
5	58.30
6	50.56
7	44.75
8	39.99
9	41.99
10	38.43
11	47.37
12	47.76
13	44.88
14	44.86
15	44.54
16	50.31
17	49.46
18	47.28
19	46.82
20	46.16

Calinski-Harabasz pseudo-F statistics were calculated for 19 possible grouping solutions for the 199 pre-cabinet careers (see Table 3.6). Of these, the two- and four-group solutions register the largest values (82.40 and 68.44, respectively). The two-group solution distinguishes between those with substantial congressional experience prior to joining the cabinet and those without. The four-group solution, described in Table 3.7, further divides the latter into a small group of cabinet members appointed following substantial stints in national administration, a similarly small group who spent ample time in a variety of state offices and, often, have some congressional experience.

The fourth group consists of those with little or no political experience prior to their appointment to the cabinet. This solution, while having a smaller pseudo-F statistic, appears to fit the data better than the more parsimonious two-group solution.

Table 3.7. Description of Pre-Cabinet Clusters

Cluster	N	% Total	Description	Sample Career
Federal Apprentices	37	18.59	Medium, Federal + Other Mix	FFFFFFFFC
Political Amateur	93	46.73	Little or No Experience	C
State Politicians	40	20.10	Long, State + Congress	RRMRHHHHHHGGC
Congressional Careerists	29	14.57	Long, Local Congress	HHHHHHHHHHHHHHHHC

Note: C = Cabinet; F = Federal Administrative; H = House; M = Mayor; R = State Legislative

Whether to report the two-group, four-group or even the six-group solution in Figure 3.7 is a decision the researcher must make in light of the research question being pursued. Like the construction of the matrix of substitution costs, any solution must be judged according to its ability to produce substantively meaningful results. The pseudo-F statistic can provide guidance, especially where two solutions appear to be equally appealing on substantive grounds. If the researcher's purpose is primarily descriptive, a more elaborate typology might be appealing. Solutions with too many clusters, however, are unlikely to be useful in statistical analysis. One criticism that has been lodged against cluster analysis techniques is their lack of external validity. Researchers have had difficulty relating the categories produced by clustering algorithms to causes and

consequences of interest (Abbott & Tsay 2000). In choosing how many clusters to focus on, the researcher must weigh description and prediction concerns.

Once a grouping solution has been selected, the typology can be used in a variety of statistical analyses. Some of the different uses of such data are demonstrated in the chapters that follow. One advantage of the sampling scheme described above is the ability to analyze career paths over time. Figure 3.8 plots the distribution of pre-cabinet careers over the 1809-1944 period. One striking feature is the steady decline in State Politicians and complementary increase in Political Amateurs. Perhaps this reflects the institution's changing function within the U.S. federal system. Whereas cabinet offices were often used to cement coalitions of state party organizations in the early 19th century, modern presidents have favored loyalty over political experience. The number of cabinet positions also expanded over this period, with departments created to serve business, labor and agricultural interests. By the 1940s, most cabinet appointees looked more like Francis Perkins, Franklin Roosevelt's Secretary of Labor, than Henry Clay, the Speaker of the House named Secretary of State by John Quincy Adams.

Figure 3.8. Over-Time Distribution of Pre-Cabinet Careers

6. Conclusion

The sequence analysis techniques described in this chapter represent a set of tools for uncovering difficult-to-discern patterns in datasets where the unit of analysis is an ordered array or sequence of events rather than an individual event or choice. Past scholarship has generally modeled the political career as a collection of isolated events or choices generated by a stochastic process. For standard statistical techniques like event history analysis, this independence assumption is necessary. Nonetheless, it ignores potentially important information about the order or sequence of events. Sequence analysis methods require no assumptions about the data generating process. However, the analyst must make important judgments in deciding how to weight various

replacement and indel operations, and in selecting a clustering algorithm and determining the number of dimensions or groups to focus on.

As the previous sections suggest, implementing sequence analysis methods is not always straightforward. Given the data collection demands they impose, the theoretical challenges involved in specifying the matrix of substitution costs, and the computational intensiveness of the OM, scaling and clustering algorithms, it is worth asking whether sequence analysis is a methodologically defensible exercise and, if so, why anyone would go to the trouble (Abbott & Tsay 2000). The question of methodological validity arises due to the absence of a probability model underlying sequence generation. Unlike the individual-level models typically used to study political careers, sequence analysis methods make no assumptions about the data generating process. Given how unrealistic the assumptions made about career decision-making tend to be, this might be seen as something of an advantage.

While the Markovian assumptions embedded in many individual-level models are implausible, the event history framework is an eminently plausible way of conceptualizing the political career. Career sequences are generated over time, often as the result of choices made at regular decision points. In contrast, the DNA metaphor, which envisions some elements in sequences being carved out and replaced by other elements, is an odd way to represent a social process that occurs in real time. Fully embracing the event history approach, however, means that career sequences can only be classified by analyzing what causes them. Of this, Abbott & Tsay (2000) argue

> [It] is the notion of describing things by analyzing what causes them—of which Durkheim's celebrated petitio principii at the beginning of Book II of *Suicide* is so perfect an example—that is philosophically worrisome.

> The only scientifically legitimate way to test hypotheses is to refer them to a measuring of social reality that they do not themselves define. Only purely descriptive methods can produce such a measuring, and therefore classification methods not based on probability models are certainly not prima facie illegitimate. The philosophical challenge is more on the other side (p. 25).

What OM lacks in mundane realism, it makes up for in its methodical way of handling a conceptually difficult and empirically intractable measurement problem.

One of the advantages of sequence analysis methods is that they perform tasks that other techniques, like event history analysis, do poorly. First, they provide a way of classifying complex career sequences into meaningful career paths. Event history techniques do not identify career paths and most researchers that use them have ignored the pattern question. Second, OM easily handles sequences containing diverse events or outcomes. Event history techniques can incorporate multiple or competing risks, and models have recently been developed to handle repeated events (see Box-Steffensmeier & Jones 2004). Nonetheless, the number of such events that can be usefully studied within an event history framework is relatively small (Abbott & Hrycak 1990). Finally, by not specifying a "true" model of a social process, OM can allow the researcher to uncover regularities in data that would otherwise be relegated to the error term (Abbott & Tsay 2000).

Pure description, however, gets the researcher only so far. In Chapter 1, I argued that the most compelling reason for paying attention to the sequential aspects of political careers is to improve understanding of the systematic component of career decision-making. Political scientists have little need for career typologies or classifications that cannot be related to individual attributes, electoral trends, political institutions, or other

explanatory variables. Similarly, if the career paths identified by sequence analysis cannot explain behavior in office, then it will be difficult to justify the time and resources needed to utilize OM. Of course, it is possible that a "correct" classification of individuals into career paths might still fail to explain voting or other behaviors of interest. Matthews's (1984) assertion that how politicians reach office ought to influence what they do while there is, after all, a hypothesis. A null result would be a substantively interesting finding that would demand further explanation.

Sequence analysis methods are best viewed as a complement rather than alternative to maximum likelihood, event history analysis and other methods typically used by political scientists. OM has been successfully applied to career data of various types and might be equally useful for studying political careers. The MDS representations and grouping solutions produced by sequence analysis methods are neither arbitrary nor illegitimate. They merely do rigorously what researchers across the sciences have been doing for centuries: categorizing and counting. If one has to classify political careers – theory dictates that we at least try – then it is best to use methods that are well-adapted for the task. The assumptions and decisions that a researcher must make to undertake sequence comparison must be weighed against the results they produce, including their ability to contribute to our understanding of political behavior and institutions. In the remaining chapters, I turn to this important task.

Appendix 1

Figure 3.A1. FileMaker Interface for Coding of Political Careers, 1

Figure 3.A2. FileMaker Interface for Coding of Political Careers, 2

Chapter 4

Professionalizing the Politicians:
Institutionalization and Careerism in Six Public Offices

Modern scholarship on political careers has been shaped by Polsby's (1968) study documenting a sharp increase in the length of service of members of the U.S. House beginning in the second half of the 19th century. Over the last 40 years, congressional careerism has been among the most well studied trends in political science. Researchers have offered different explanations for Polsby's trend, including: 1. changes in internal organization, i.e., the emergence of strong committees and a seniority norm that made service more predictable (Polsby, Gallaher & Rundquist 1969; Shepsle 1978), 2. changes in economic organization that led congressional majorities to enhance institutional capacity (Wiebe 1967; Skowronek 1982; Schickler 2001), 3. changes in party competition that reduced electoral obstacles to reelection (Price 1971, 1975, 1977), and 4. changes in electoral system institutions that eroded the effectiveness of national party campaigns and encouraged members to cultivate a personal vote (Cain, Ferejohn & Fiorina 1987; Katz & Sala 1996).

Far less attention has been paid to the political experiences of individuals prior to entering Congress or to what they do after they leave. There are also much fewer studies of the careers of politicians occupying other U.S. public offices. The relentless focus on Congress has obscured the possibility that rising careerism and complementary institutional developments were happening elsewhere. What studies have been published tend, like much research on congressional careers, to limit empirical analysis to a single

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office over a short period of time. With respect to the political career – the whole sequence of office-holding events that comprise an individual's life in public service – it is not unreasonable to say that what we know is limited to what a select few politicians opted to do while occupying mostly legislative offices.

In this chapter, I adopt an expansive view of the political career that incorporates the entire sequence of public offices held by individuals elected or appointed to multiple high offices in the U.S. Toward this end, I compiled complete career sequences for individuals occupying six public offices – the U.S. cabinet, House, Senate and federal judiciary as well as governor and big city mayor – between 1809 and 1944. These data provide the most complete portrait of the political career in the U.S. yet assembled and allow me to compare the experiences and attributes of incumbents within and across offices over time. To make sense of the differences among these complex sequences of events, I use sequence analysis methods (Abbott 1995; Macindoe & Abbott 2004). Specifically, I apply an optimal matching algorithm that produces a matrix of distances that capture differences among individuals in the number, type and order of offices they occupied prior to reaching these six "destination" offices.

Substantively, I show that congressional careerism was part of a broader professionalization of the political career in the late 19th century. The essential features of professionalization included: 1. increasing length of service among those serving in six destination offices, 2. growth in the share of professional politicians occupying these offices, and 3. increasingly elaborate and specialized careers prior to reaching these offices. The consequences of professionalization include the replacement of the political

amateur celebrated by Jefferson and Jacksonian lore by professional politicians with increasingly specialized experiences.

This paper proceeds as follows. The next section briefly reviews past scholarship on political careers, noting the prevalence of single-office studies and the recent move toward individual-level models of career decision-making. I then discuss the political career as a conceptual and measurement problem before settling on two operational definitions of the professional politician. Several empirical sections follow, beginning with a description of the data collection and coding procedures used for this study. I then use the operational definitions to show how careerism changed across the U.S. office-holding system between 1809 and 1944. Next, I provide a brief overview of the sequence analysis methods used to measure differences in the number, type and order of offices occupied. These methods are then used to examine whether the paths to the six destination offices were becoming more specialized over time. The final section discusses the implications of the findings reported in previous sections and suggests avenues for future research.

1. Literature Review

Studies of the political career have been powerfully shaped by efforts to understand the modernization of the U.S. House and its consequences. The primary symptom of modernization was the sharp rise in careerism among House members between 1877 and 1965 (Polsby 1968). Polsby (1968) observed that over the second half of the 19th century, average tenure nearly doubled and the share of freshmen declined from nearly two-thirds to 25 percent. Careerism only accelerated after the turn of the

century. Inside the House, careerism's effects were being felt in the form of institutionalization, a developmental process characterized by the evolution of clear organizational boundaries, increasing internal complexity and adoption of well-defined decision-making rules (Polsby 1968). Exhibits A and B in the case for institutionalization were the rise of an elaborate committee system featuring substantial division of labor and a seniority norm that regulated members' competition for power and influence.

Polsby (1968) did not explicitly identify institutionalization as the central cause of careerism, but did state that the two were tightly linked. Subsequent work has argued more forcefully for a causal relationship between institutionalization and congressional careerism. Bullock (1972), for example, observed that the share of House members with 10 or more terms of service more than doubled from 1941 to 1971. He attributed this growth in careerism to a combination of new reasons for staying – i.e., the seniority system, expanding scope of federal power and institutionalization – and greater electoral security. Cooper & West (1981) and Hibbing (1982) similarly argued that growing disaffection with House service – in the form of increasing workloads, reduced institutional capacity, and greater constituent demands – was a key cause of increasing retirement rates during the 1970s.

Scholarly focus on the link between institutionalization and careerism has been encouraged by studies that find previous political experience has minimal effects on behavior in office. In a comprehensive study, Bogue et al. (1976) found that the backgrounds and experiences of members of Congress changed little over the course of history. They concluded that researchers must to look at changes within the House, i.e.,

institutionalization, to explain rising careerism. More broadly, Matthews (1984), in a detailed review of the literature, found that empirical studies of who belongs to legislative assemblies and how they got there had yet to demonstrate that recruitment matters for legislative behavior or institutional change.

One response to this failure to link recruitment and behavior has been a conscious move by empirical researchers away from aggregate-level analyses in favor of individual-level models of career decision-making. These models are used to characterize the choice process facing legislators at regular decision points. In justifying the focus on individual choices, Hall & Van Houweling (1995) argue that a better understanding of the individual career calculus is necessary if scholars are to fully comprehend the patterns in aggregate-level time series. Individual-level models have drawn attention to the factors that shape decisions to run for reelection, retire or move to another office. They have also made several methodological contributions, including the use of event history techniques. In doing so, however, they have made little attempt to link knowledge of macro-level career patterns and micro-level decision-making processes. As a result, the vast majority of studies ignore previous political experiences, i.e., career paths.

Research on the careers of politicians occupying other high offices in the U.S. federal system has been sparse compared to the extensive literature on congressional careers. Squire (1988, 1992) has published multiple studies of the institutionalization of state legislatures and its impact on members' career opportunities. Among the relatively few systematic studies of gubernatorial careers, Beyle (1990, 2004) and Hamman (2004) find that previous experience matters for performance. The bulk of studies on the mayoral career are biographical or focused on a single administration or community. The

systematic studies that have been published depict the office as a dead-end job (Gittell 1963; Murphy 1980).[12] There is also growing interest in judges' previous experiences and judicial tenure (Spriggs & Wahlbeck 1995), especially for the U.S. Supreme Court (Vining et al. 2006). With respect to judges, Yoon (2003) finds that changes in remuneration had little effect on judicial tenure between 1945 and 2000. Epstein et al. (2003) argue that the norm of prior judicial experience has reduced diversity among federal judges. Finally, the few existing studies of the cabinet career find that the appointing practices of presidents largely determine tenure in office (Fenno 1959; Cohen 1985).

The exclusive focus on the office-based career (ignoring both previous experiences and subsequent political activity) limits the use of these single-office studies in understanding the political career more generally. Complementing this body of work are many studies that seek to identify the paths to different public offices and model the decision to seek higher office. Schlesinger's (1966) study of political ambition is the foundational work in this field. Schlesinger asserted that a hierarchy of offices existed in the U.S., with a large number of local and state positions grooming politicians for service in a few prominent statewide and national offices. The sheer number of available public offices and the fact of open competition preclude overly rigid career paths. Nonetheless, the orderliness of career paths is enhanced by several features of the opportunity structure, including the party system, "manifest" conditions linking public offices, and

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[12] An exception is McNitt (2003), which documents a sharp rise in tenure among big city mayors and relates tenure to performance in office.

political institutions that determine how often opportunities for reaching these offices arise.

Work on political ambition has also been heavily influenced by the move from aggregate-level analyses to individual-level models. Using the strategic politicians framework (Jacobson & Kernell 1981), researchers have identified the correlates of ambition and proposed models to predict which politicians will attempt to seek higher office. Rohde's (1979) analysis of members of the U.S. House was the first study of this kind. Rhode assessed the benefits, risks and costs of seeking a Senate seat or gubernatorial post and compared his predictions with actual transitions to these offices. Rohde's claims were re-analyzed by Brace (1984) using a multivariate probit model. Similar analyses have been employed to study transitions between other pairs of offices, including the move from governor to the U.S. Senate (Codispoti 1987), U.S. House to the Senate (Francis 1993) and House to federal bureaucracy (Palmer & Vogel 1995). A number of researchers have also studied the transition between legislative assemblies in the 50 states and the U.S. House (Berkman 1994; Maestas et al. 2006).

These studies, which include an expanding comparative literature,[13] highlight the increasing attention paid to political ambition and opportunity structures that give shape to it. Better understanding of why politicians seek particular offices and the factors that influence their ability to reach them has both theoretical and practical importance. If Schlesinger is correct that behavior in office is shaped by political ambition, particularly the office goals of professional politicians, then changes in the relationship among public

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[13] See, for example, Berlinski et al. (2007) on ministerial tenure in the UK, Samuels (2000a, 2000b) on legislative careers in Brazil, Scarrow (1997) on the path to the European Parliament, and Jones et al. (2003) on professionalization in Argentina.

offices will lead to changes in the decisions that politicians make (Codispoti 1987). This chapter seeks to extend the work of Schlesinger and others by identifying broad changes in the relationship among different offices. I do so by studying the career patterns of incumbents for six destination offices. Gathering data on multiple offices allows me to assess whether changes in career patterns, i.e., rising careerism, were unique to particular offices and historical eras or extended across the U.S. federal system.

2. Professional Politicians: Theory and Measurement

The definition of the word career is ambiguous, both in everyday usage and scholarly parlance. The dictionary defines "career" alternatively as "one's calling" and "one's occupation." Thus, the term conflates intangible intentions – "the desire to make a difference" – and observable achievements – "years in public office." The only link between these contrary definitional aspects is longevity. If politics is truly one's calling, then such intentions ought to be manifested in tangible activities and sustained over time. It is difficult, for example, to consider an individual who served in a political office for a single year in between long stints in private-sector employment as making a career of politics.

Existing research on political careers has wrestled with the ambiguity of the "political career." Indeed, scholars have questioned whether politics ought to be considered a profession alongside traditional vocations like medicine, law and teaching (Lasswell 1960; King 1981). Politics differs from other professions in the ease with which public offices can be assumed by non-specialists. While state governments have erected substantial barriers to entry for many professions – regulating, for example, who

can practice medicine or law – there are comparatively few restrictions on political office-holding. Most public offices, especially those filled via elections, are open to any individual who satisfies minimal age and residency requirements. Similarly, politics differs from other professions in the frequency of involuntary termination. Those in traditional vocations can be terminated by the firm or the customers they work for, though this is more the exception than the norm. Many in politics face the prospect of involuntary termination every couple of years even if their performance has been exemplary. The threat of electoral defeat is omnipresent and powerfully shapes behavior in office.

These differences have plagued attempts to define professionalization and efforts to identify the professional politician. Black (1972), for example, defines professionalism as a personal outlook. The professional politician sees himself as a politician, perceives that politics involves bargaining and believes in the importance of bargaining. Wilson (1966), similarly, defines the professional politician as one who perceives politics as a game with winners and losers, and seeks to maximize her own or her party's power. The amateur, on the other hand, finds politics to be intrinsically interesting and views his purpose as pursuing the public interest. Squire (1992) on the other hand, defines professionalization as an attribute of institutions. The professional legislature is practically defined as a lawmaking body whose members receive a hefty salary, enjoy high levels of staff support and facilities, and face substantial demands on their time. He distinguishes professionalization from the vague notion of institutionalization.

In a lengthy definitional digression, King (1981) rejects the term professional politician, claiming that politics "is not a profession in any ordinary sense" (p. 251). He finds that politics is seldom listed in standard treatises on the professions and that politicians fail to conform to five traits that characterize the "professional." These are: 1. the practice of a full-time occupation, which comprises a primary source of income, 2. commitment to a calling in the sense of having concrete normative expectations, 3. membership in a professional organization, 4. a tendency to have specialized skills or training, and 5. substantial professional autonomy, e.g., lay persons seldom tell a doctor how to perform surgery. King argues that politicians do not belong to a professional organization and do not enjoy professional autonomy.

This dismissal of the professional politician seems premature. Most politicians who ascend to high office in the U.S., including the six destination offices studied here, do practice politics on a full-time basis, as these positions impose substantial demands on their time. Whether politicians are also committed to a calling is difficult to observe though there is no evidence they are any less committed than lawyers or other professionals. Indeed, given the sacrifices those in public life often make, it is likely that their level of commitment is equally strong. It is true that politicians do not belong to an organization like the American Political Science Association. The vast majority, however, belong to a political party. Those who do not are usually not professional politicians. Furthermore, politicians do acquire specialized training or skills, even if these skills are more useful for achieving reelection than making public policy.

Finally, in assessing politicians' professional autonomy, King adopts an unnecessarily limited conception of the term. Non-experts do question the votes and

positions that politicians take. However, politicians are still viewed as experts in the electoral arena. Indeed, with the passage of ballot reform and primary elections, individual self-interested politicians replaced state and local party bosses as the unparalleled sages in electoral strategy. From this perspective, the term "professional politician" is a fine description of the individuals at the heart of this project. Whether any one or all of the high offices are staffed by professional politicians is an empirical question with important ramifications for issues of representation and state capacity.

Not every individual who serves in public life can be considered a professional politician. Indeed, given the thousands of public offices supported by national, state and local governments, it is difficult to imagine how democratic governments could function without substantial participation by ordinary citizens. Indeed, early American political discourse celebrated the "citizen politician," a political amateur who would temporarily lay down the plow to take his turn in public service. Citizen politicians were the decision-makers in the town halls revered by Jefferson. Later, Jacksonian leaders would defend the spoils system based on claims that most government positions could be filled ably by non-professionals (though it seems not non-partisans). With the expansion of white male suffrage and growth of national, state and local governments, there was ample opportunity for political amateurs to participate in public life.

Despite the rhetoric, many of the highest offices in the U.S. federal system have always been filled by seasoned professionals with substantial political resumes. Few among the Founders could be considered political amateurs even by modern standards. From the beginning of the Republic, the highest offices have attracted men with substantial pedigrees. For all their rhetoric, many Jacksonians were seasoned

professionals. John McLean, for example, served in state office and Congress before becoming U.S. Postmaster General under Presidents Monroe and Adams. McLean was then offered a cabinet post by Andrew Jackson, but instead accepted an appointment to the U.S. Supreme Court.[14] From that lofty perch, he made several unsuccessful runs at the presidency. As this example suggests, the path to high office could be long and complex, including long service in diplomatic and state government capacities. Indeed, in the Early Republic, the ambitions of politicians were focused as much on the state legislature and governor as on Congress (Kernell 1981).

In practice, distinguishing the professional politicians from those who stumble in and out of politics can be a tricky exercise. Researchers have solved this problem by focusing on the career inside institutions like the U.S. House and Senate. Hibbing (1991), for example, defines those with more than 10 years of continuous House service as careerists. This focus reflects the difficulty of collecting detailed information on the previous political experiences of individuals serving in most public offices. Jacobson (1989) distinguishes between those with prior elective experiences and those without. In taking stock of the whole sequence of offices that make up a political career, these

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[14] Indeed, McLean's decision to join the Court was undertaken in expectation that the position would catapult him into national prominence. The ante-bellum Supreme Court lacked the comforts and prestige it enjoyed in the mid-20th century. As an Associate Justice, McLean rode circuit where he held trial court proceedings with a district judge. Sources indicate he traveled 2,500 miles in 1838 alone. McLean's appointment did little to quash his political ambitions, though it did little to further them either. He was one of the few justices to publish his opinions and wrote countless letters to newspapers publishing his views on political topics. Much of this commentary was designed to stoke his presidential ambitions. McLean actively sought the presidency, as an Anti-Jackson candidate in 1836, Whig and Free Soil parties in 1848, and finally for the Republican tickets in 1856 and 1860. His campaigning drew the ire of those who believed that judges ought to separate themselves from the political sphere. His opposition to the Mexican War in 1847, for example, was rebuked by the leading newspapers, which called him a "judicial politician" guilty of "dragging the ermine in the mire of politics" and displaying "party violence on the bench" (Westin 1962; Weisenberger 1937). Westin (1962) cites McLean as an example of how the judicial and political spheres were not easily separated in the ante-bellum period.

measures are of little help in constructing a general definition of the political professional.

In constructing a measure of the professional politician, several characteristics come to mind. The most obvious is longevity. Long stays in public office, especially when this service is recent and uninterrupted, suggest a politician is in for the long haul. Another potential characteristic of the professional politician is movement between offices. Those who transition from one office to another, especially where the transition involves an active choice (i.e., winning an election) demonstrate the kind of progressive ambition that infects the careerist. In terms of personal attributes, age of entry might also indicate professional commitment. Those who intend to make a career enter politics earlier than those who do not. Professionals are also characterized by political resiliency. Most long political careers feature at least one setback. Theodore Roosevelt lost badly in New York's 1886 mayoral election. Caleb Cushing, U.S. Attorney General during the Pierce Administration, had suffered four serious electoral defeats and was toiling in obscurity as Mayor of Newburyport, Massachusetts before being named to the cabinet. Finally, many professional politicians are engaged in substantial non-official political activity, e.g., service as an active party official or attending a convention, engaging in reform campaigns or standing as a presidential elector.

Using age of entry as a criterion, while compelling, seeks to assume what must be demonstrated. In any case, age by itself says little about long-term acumen for and commitment to politics. Many aspiring politicians make brief forays into politics before moving on to other employment. Similarly, service in a non-official capacity denotes an interest in politics, but not necessarily professional acumen. Finally, a return from

political defeat is a compelling indicator of both interest and acumen, but is difficult to document systematically. In lieu of these difficulties, I focus on longevity and transitions. Longevity, experienced in one or multiple offices, indicates a commitment to politics and a revealed preference for public over private employment. The number of public offices occupied, where high, suggests both political ambition and an ability to adapt to different electoral or functional circumstances. In taking stock of the working life, the professional politician is an individual whose career exhibits substantial longevity in public office or experience in a large number of political positions. Operationally, I define the professional politician as an individual whose career includes either 20 years in public service or five or more political jobs.

In looking at the career as a whole, this definition succeeds in separating those who dedicated their working lives to politics from those who either made a short go of it or treated public service as less than a full-time activity. For diagnosing professionalism in the midst of a career – i.e., prior to entering one of the six destination offices studied here – a less stringent definition is needed. For this purpose, I define the professional politician as an individual whose career includes at least 10 years in public service or three or more political jobs. This level of experience puts the officeholder at least halfway toward the 20-year or five-office benchmark for the whole career. It provides a measure for assessing whether individuals arrive at each office as seasoned professionals or are professionalized once they get there. In identifying the political professional mid-career, this definition enables the researcher to determine whether professionals and non-professionals make different decisions in office.

3. Data and Coding

The data used in this chapter include complete career sequences for nearly 6,000 individuals who held the office of U.S. cabinet member, senator, representative, federal judge, state governor or big city mayor. The primary purpose of collecting this data was to examine career patterns among those holding these different offices. I was also interested in what the main career paths to these various offices looked like and whether they had changed over time. The period of study I chose runs from the Early Republican Era to World War II (1809 to 1944). Unfortunately, the costs of collecting career sequences for *all* individuals holding these six offices were prohibitive. In lieu of compiling a complete census, I identified five historical eras between 1809 and 1944 and collected detailed information on every individual who served in these offices during those eras. [15] Table 4.1 lists the five historical eras chosen for each office and the number of careers they include.

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[15] The intervals vary slightly for certain offices, such as the U.S. House, where the data collection demands increase exponentially with the number of years surveyed.

Table 4.1. Career-Year Observations By Office and Era

	1	2	3	4	5	Total
Senate	1810-1824	1848-1860	1868-1878	1894-1926	1930-1940	
Careers	116	132	138	348	124	858
Car.-Yrs.	2376	2267	2588	6756	3013	17000
House	1814-1822	1852-1860	1870-1878	1894-1900	1930-1940	
Careers	477	595	736	540	693	3041
Car.-Yrs.	6837	7456	9854	7998	14798	46943
Cabinet	1809-1828	1849-1860	1869-1881	1893-1912	1928-1944	
Careers	23	36	52	51	37	199
Car.-Yrs.	648	831	1081	813	707	4080
Judges	1809-1828	1849-1860	1866-1879	1893-1912	1928-1944	
Careers	46	37	80	194	254	611
Car.-Yrs.	1108	719	1812	4894	7053	15586
Governors	1814-1829	1849-1860	1867-1881	1890-1910	1930-1940	
Careers	121	146	186	292	139	884
Car.-Yrs.	2405	2535	2958	4621	2427	14946
Mayors	1814-1829	1849-1860	1867-1881	1890-1927	1928-1944	
Careers	21	95	87	141	46	390
Car.-Yrs.	305	1023	989	2192	828	5337
Careers	804	1041	1279	1566	1293	5983
Car.-Yrs.	13679	14831	19282	27274	28826	103892

The decision rule that I used to select individuals into the dataset was straightforward. Individuals were included if they began their tenure in the U.S. cabinet, House, Senate, federal judiciary, or as governor and mayor during any of these five eras. Individuals who did not occupy one of these six offices were excluded. Individuals who occupied an office, but began service prior to the start or after the end dates of particular eras were also excluded. This sampling scheme yielded five cohorts of individuals for each office – 30 cohorts in all. Since each cohort includes all individuals beginning service in an office within a particular era, the sampling scheme allows me to characterize in great detail the political career at five points in U.S. history. Similarly, by collecting information on individuals holding different offices, it is possible to compare career paths within and across offices over time.

The main disadvantage of the sampling scheme described here is that it does not allow precise measurement of the causes of the career patterns uncovered here. This is especially true with respect to the effects of political institutions on the careers of individuals within offices over time. To assess the impact of institutions, it is necessary to collect career sequences before and after institutional changes. Because the effects of such changes work their way through the political system over time, long pre- and post-intervals are desirable. The historical eras utilized here are insufficient for examining rigorously the impact of many institutions (e.g., ballot reform, primary elections) identified by scholars. Thus, the conclusions I reach about causes will, of necessity, be speculative.

Career data were obtained from biographical directories for each office.[16] To assemble the sequence of office-holding events for each individual, I followed three basic steps. In Step 1, biographical information was transferred from the directories to a FileMaker Pro database file.[17] Each public office occupied by an individual was entered in the order it was occupied. Start and end dates for each office were recorded along with information about the individual's age, education, non-public occupations, party affiliation and electoral experiences.

In Step 2, public-sector jobs were further assigned one of 20 values from a typology of local, state and federal offices. Table 4.2 reproduces the typology of offices used here. Each office type was given a letter code to distinguish it from other types. Federal law enforcement offices, for example, were all assigned the letter "L." Service in a state legislature is denoted by the letter "R." In Step 3, the sequence of public offices for each individual was constructed by assembling an "office-year string" for every office in the public career. Each string consists of a letter code for the office repeated once for each year the office was occupied. If an individual served in a state legislature for four years, then the string "RRRR" would be added to the sequence. For each individual, the office-year strings were then concatenated in the order of offices occupied to form a final career sequence.

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[16] See references to Chase et al. 1976, Holli & d'A. Jones 1981, Kallenbach & Kallenbach 1982, Treese 1997 and Vexler 1975.

[17] Database programs like Microsoft Access and FileMaker Pro allow coders to design interfaces that use check-boxes, radio buttons, pull-down menus and authentication routines. These tools help minimize typing and other coding errors.

Table 4.2. Classification of Public Sector Jobs

Level	Function			
	ADMINISTRATIVE	EXECUTIVE	JUDICIAL	LEGISLATIVE
FEDERAL	Administrator (F) (*Counsel, FTC*)	President (X)	Federal Judge (J) (*Associate Justice, U.S. Court of Appeals*)	Representative (H)
				Senator (S)
	Law Enforcement (L) (*U.S. Attorney*)	Cabinet Officer (C) (*U.S. Attorney General*)		
	Diplomat (D) (*Minister to Italy*)			
STATE	Administrator (A) (*Director, State Equalization Board*)	Governor (G)	State Judge (W) (*Chief Justice, Supreme Court of Ohio*)	State Legislature (R)
	Law Enforcement (U) (*District Attorney*)	State Executive (E) (*Secretary of State*)		
LOCAL	Administrator (Q) (*Director, Parks Department*)	Mayor (M)	Local Judge (V) (*Probate Judge*)	City Council (B)
	Law Enforcement (K) (*Police Officer*)	Local Executive (T) (*Deputy Mayor*)		

Note: Letters in parentheses are letter codes used to denote different job types. Positions in italics are examples of the various job types.

Figure 4.1 shows complete sequences for two cabinet members, Frederick Frelinghuysen and John Hay. The career sequence for Frederick Frelinghuysen combines five office-year strings. Frelinghuysen was part of a prominent New Jersey political family – his grandfather served in the Continental Congress and U.S. Senate, his uncle had been Attorney General of New Jersey and a U.S. Senator. He began his career as City Attorney of Newark in 1849 ("K") and was a member of the city council in 1850 ("B"). A lawyer in private practice for many years, Frelinghuysen was appointed to the U.S. Senate in 1866. He was elected to fill the remaining two years of the Senate term in 1867, but was prevented from serving longer by the state legislature ("SSS"). Frelinghuysen served another term in the Senate between 1871 and 1877 ("SSSSSS"). In 1881, he was appointed U.S. Secretary of State by President Arthur, serving four years ("CCCC"). He returned home in 1885 and died shortly thereafter.

John Hay began his political career in 1861 as secretary to President Abraham Lincoln, ostensibly while serving as a clerk in the Interior Department ("FFF"). In 1865, he was named Secretary to the American Legation in Paris, where he served until 1867 ("DD"). Hay was briefly Charge d'Affaires at Vienna in 1868 ("D") and Secretary to the Legation in Madrid ("D") before returning to the U.S. After several years in the private sector, Hay returned to public service in 1878 as Assistant Secretary of State ("FFF"). He left office in 1881 and served as editor of the *New York Tribune* for many years. In 1897, he was named Ambassador to the United Kingdom ("D"). Shortly thereafter, President McKinley named Hay U.S. Secretary of State. Hay held the post after McKinley's assassination, serving until his death in July 1905 ("CCCCCCC").

Frederick T. Frelinghuysen, U.S. Secretary of State

K B E E E E E S S S S S S S S S <u>C</u> <u>C</u> <u>C</u> <u>C</u>

ϕ ϕ F F F D D D D F F F D C C C <u>C</u> <u>C</u> <u>C</u> <u>C</u>

John M. Hay, U.S. Secretary of State

B = Local Legislative; C = Cabinet; D = Federal Diplomatic; E = State Executive; F = Federal Administrative; K = Local Law Enforcement; S = Senate

Step 1: Insert element K
Step 2: Insert element B
Step 3: Replace element F with element E
Step 4: Replace F with E
Step 5: Replace F with E
Step 6: Replace element D with E
Step 7: Replace D with E
Step 8: Replace D with element S
Step 9: Replace D with S
Step 10: Replace F with S
Step 11: Replace F with S
Step 12: Replace F with S
Step 13: Replace D with S
Step 14: Replace element C with S
Step 15: Replace C with S
Step 16: Replace C with S

Figure 4.1. Alignment of Career Sequences for Two Cabinet Members

4. Professional Politicians in the U.S., 1809-1944

Congressional scholars have made much of the sharp rise in careerism during the first half of the 20th century. Panel B in Figure 4.2 plots the cumulative distribution of seniority among members of the U.S. House during each of the five historical eras

discussed above.[18] The graph captures the changing composition of House membership over the 1814 to 1940 period. Consistent with Polsby (1968) and others, the declining share of those with five years or less of House experience is striking. In the first era, 1814-1822, those with five years or less account for two-thirds of those serving. By the fifth era, 1930-1940, only 39 percent of members have House careers lasting five years or less. The share of those with 15 years or more of House experience increased from less than five to 20 percent over the entire period.

The trend lines for the Senate are not as dramatic, but tell much the same story. As Panel 4.2A shows, those whose Senate career lasted five years or less comprise approximately 41 percent of those serving between 1814 and 1824. That is, nearly four in 10 senators in the first cohort failed to serve a full six-year term. By the end of our period of study, this percentage had dropped to less than 30 percent. The difference was made up by those whose service lasted 15 years or more. The share of these individuals increased from seven to 20 percent over the entire period. The share of those with Senate careers exceeding 10 years increased from 27 to 40 percent. This lengthening of the congressional career is the inspiration behind efforts to identify the correlates of retirement and a continuing source of debate in career studies.

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[18] Shares were calculated as the number of members whose House career lasted *n* years – e.g., five years or less, six to 10 years, 11 to 15 years, more than 15 years – divided by the total number who served during the period.

A. Senate   *B. House*

Figure 4.2. Cumulative Share of Members of the Senate and House by Level of Experience

Within this debate, the possibility that careerism was on the rise for other public offices has been overlooked. However, a cursory examination of tenure patterns for the other four offices indicates that careerism was increasing across the U.S. federal system. Panel C in Figure 4.3 shows the cumulative distribution of experience for two appointed offices – the U.S. cabinet and federal judiciary. For the cabinet, there is a large initial decline in cumulative experience from the 1809-1828 to 1849-1860 eras. From the second to fifth cohorts the trend lines resemble those for the U.S. House, albeit on a different scale. The share of those whose cabinet careers lasted two years or less decreased from 44 to 27 percent. Those with six or more years of cabinet service increased from six to 16 percent. These trends are impressive, given the changes in cabinet composition that occurred over this period. From the Madison to Roosevelt administrations, the number of cabinet positions doubled, with new departments created to serve electoral constituencies – e.g., unions, farmers and businesses. By the 1928-1944 era, the cabinet career looks much like it did in the initial period, when the office was limited to leadership of just a few departments (i.e., State, Treasury, Justice, War and the Post Office).

C. Cabinet

D. Federal Judiciary

Figure 4.3. Cumulative Share of Cabinet Members and Federal Judges by Level of Experience

Panel D in Figure 4.3 presents the distribution for those appointed to the federal judiciary. Unlike members of the cabinet, whose tenure typically ends when the presidents they serve leave office, federal judges serve terms of good behavior. Lifetime appointment facilitates lengthy careers on the federal bench. Surprisingly, the modal judicial career was not especially long in the Early Republic. Thirty percent of those serving in the federal judiciary between 1809 and 1828 had stints that spanned five years or less. More than three quarters served for 15 years or less. By the New Deal period, judicial careerism had increased dramatically. Only 15 percent of judicial careers lasted five years or less. Roughly six in 10 lasted more than 15 years, with a sizable portion (15 percent) lasting more than 25 years.

Panels E and F in Figure 4.4 show comparable results for governors and mayors, two executive offices with fixed terms. As with the U.S. cabinet, there was a significant reduction in cumulative experience between the first and second cohorts. The share of those with mayoral careers lasting two years or less increased from 24 to 43 percent. Those with less than four years of mayoral service increased from 45 to 87 percent. The trend from the 1849-1860 era on, however, indicates rising careerism. By the last cohort, those with two years or less of mayoral service account for just one quarter of those serving. Those with six years or more in the mayor's office increased from six to a whopping 35 percent.

The trends are much less pronounced for governors. Panel 4.4E shows a modest decline in the share of those whose gubernatorial career lasted two years or less between the 1849-1860 and 1930-1940 eras (20 to seven percent). Those with gubernatorial careers of four years or less dropped from 71 to 33 percent. By implication, those with

more than four years increased from 29 to 66 percent. Those with six years or more accounted for an increasing share of gubernatorial careers, 16 percent by the 1930-1940 era. Together, Panels 4.4E and 4.4F show that even for executive offices, which feature comparatively few politicians serving in highly demanding jobs with fixed terms, careerism was on the rise.

These figures are interesting not so much for what they convey as for what they imply. They indicate that rising careerism, a central preoccupation of congressional studies, was not limited to the U.S. House and Senate. Careerism was pervasive in the U.S. between the Civil War and World War II. It extended to multiple offices, from executive positions with fixed terms to appointed positions with unlimited terms. It affected all three branches of the national government and was felt at the pinnacles of state and local government. In terms of existing scholarship, these trends require scholars to look beyond traditional office-based explanations for rising careerism. Specifically, analyses limited to particular components of an institution (e.g., the committee system in Congress) will be at best, partial explanations.

E. Governors

Cumulative Share with … as Governor

More Than Six Years

Five to Six Years

Three to Four Years

Two Years or Less

Cohort: 1814-1829, 1849-1860, 1867-1881, 1890-1910, 1930-1940

F. Mayors

Cumulative Share with … as Mayor

More Than Six Years

Five to Six Years

Three to Four Years

Two Years or Less

Cohort: 1814-1829, 1849-1860, 1867-1881, 1890-1927, 1928-1944

Figure 4.4. Cumulative Share of Governors and Big City Mayors by Level of Experience

4.1 Emergence of Professional Politicians

Given the pervasiveness of the trends depicted in Figures 4.2, 4.3 and 4.4, causal explanations that rely solely on internal changes, i.e., institutionalization, are likely to provide an incomplete account of rising careerism, congressional or otherwise. In terms of consequences, longer terms of service within these offices contributed to the professionalization of political careers and the emergence of professional politicians. Figure 4.5 plots the share of individuals in each office whose career experiences place them in the professional category – i.e., 20 years of public service or five public offices. For four of the offices – Senate, House, federal judge and mayor – there is a u-shaped pattern whereby the share of professional politicians declines after the first cohort, gradually rises between eras two and four, and increases markedly during the fifth era. For governors and the cabinet, the share of professionals declines from a high starting point. For the cabinet, there is a sharp reversal in the trend for the 1928-1944 era.

The patterns in Figure 4.5 are consistent with the work of Progressive Era historians (Wiebe 1967; Chandler 1977; Carpenter 2001), which describes the late 19th and early 20th centuries as a period marked by extensive professionalization of private- and public-sector organizations. Within the private sector, railroad companies and other firms were expanding and adopting increasingly complex management hierarchies (Chandler 1977). Inside the federal government, administrative capacities were expanding in response to the challenges of industrialism (Skowronek 1982; Campbell 1995). Executive branch departments, like the Department of Agriculture, were developing specialized bureaus to spur commerce and spread new technologies. Within

these agencies, increasingly elaborate career tracks and bureaucratic cultures developed, contributing to greater institutional capacity and autonomy (Carpenter 2001).

Researchers have similarly observed how national political institutions responded to the challenges posed by industrial development. Inside Congress, majorities approved reforms that strengthened oversight capacities (Schickler 2001). Committees were granted substantial autonomy over public policies falling within their jurisdiction. In lieu of relying on the prerogatives of Speakers, authority over committee assignments was decentralized. Party caucuses were given authority to compile rosters, but the seniority norm determined advancement inside the chamber (Shepsle 1978). As legislators were adopting measures to strengthen capacity, they were also seeking to lighten their workload. Congress delegated authority for managing executive agencies and stabilizing the economy to presidents, and granted them additional resources to accomplish these tasks (Sundquist 1981). The federal court system was expanded to deal with an ever-growing workload and the Supreme Court secured the right to manage its own docket (McCubbins, Noll & Weingast 1995; de Figueiredo et al. 2000).

A. Senate, House, Cabinet

A. Judges, Governors, Mayors

Figure 4.5. Share of Professional Politicians by Office and Era

The nationalization of policy-making authority during this period did not inhibit the expansion of both state and local governments. Indeed, whereas federal per capita domestic spending increased from \$1.26 to \$13.22 between 1880 and 1927, state spending grew from \$1.25 to \$17.20. Federal and state activity was dwarfed by local government per capita spending, which increased from \$6.75 to \$48.41 over the same period (Campbell 1992). State governments were pioneers in the area of social policy, with most adopting compulsory education and aid programs for the poor and elderly prior to the New Deal. Economic regulatory activity increased as well, with anti-trust legislation and workplace protections adopted in many states (Keller 1977, 1990; Campbell 1992, 1995). Meanwhile, both state and local governments were adopting constitutions, amendments and charters that strengthened the prerogatives of executives at the expense of machine-dominated legislatures. The terms of governors and mayors were lengthened and appointment powers were expanded.

With the powers and prestige of the more prominent public offices expanding in the late 19th century, it is no surprise that they increasingly came to be occupied by career-minded professional politicians. Were these institutional developments sufficient to explain the emergence of the professional politician? Bogue et al. (1976) conclude that the increasing share of professional politicians in Congress was entirely driven by internal changes, i.e., institutionalization. Schlesinger (1996), however, argues that the evolution of the modern office-holding system in the U.S. was characterized by increasingly elaborate paths to high offices. Professionalization, not institutionalization

accounts for the greater prevalence of professional politicians occupying these destination offices.

Disentangling the institutionalization from professionalization explanation is a difficult empirical task. Fortunately, a few critical expectations about the resumes of individuals serving in these high public offices can help distinguish these explanations. One expectation concerns the acquisition of specialized skills or training – an attribute that separates the professional politician from the amateur. Professional politicians possess more and specialized training than amateurs. If institutionalization is the primary cause of the emergence of professional politicians, then the bulk of this training ought to have been acquired within the offices studied here. If professionalization is to blame, then we ought to observe individuals spending more time acquiring training before reaching high office. Similarly, we ought to observe differences in individuals' previous experiences depending on whether they are occupying a legislative, executive or judicial office, i.e., greater specialization. The careers of those reaching the Senate, for example, will differ from the careers of those reaching the federal judiciary.

Table 4.3A. Professionalization By Era – Senate, House and Cabinet

Era[a]		Senate			House			Cabinet		
		Before	During	Other[b]	Before	During	Other[b]	Before	During	Other[b]
1	%	64.66	27.59	7.76	26.42	52.62	20.96	82.61	17.39	0.00
	N	75	32	9	126	251	100	19	4	0
2	%	57.58	31.82	10.61	27.40	44.37	28.24	86.11	11.11	2.78
	N	76	42	14	163	264	168	31	4	1
3	%	51.45	39.86	8.70	35.46	43.07	21.47	73.08	19.23	7.69
	N	71	55	12	261	317	158	38	10	4
4	%	55.46	29.60	14.94	25.56	46.67	27.78	50.98	37.26	11.76
	N	193	103	52	138	252	150	26	19	6
5	%	62.90	29.84	7.26	42.28	43.00	14.72	72.97	18.92	8.11
	N	78	37	9	293	298	102	27	7	3
Total	%	57.46	31.35	11.19	32.26	45.45	22.30	70.85	22.11	7.04
	N	493	269	96	981	1382	678	151	44	14

[a] See Table 4.1 for years captured in each era.
[b] Combines individuals professionalized after service in destination office or never professionalized at all.
NOTE: Cell entries indicate for each office, era and stage of the political career the number of percentage of incumbents with 10 years or more of public service or three or more public offices.

Tables 4.3A and 4.3B indicate the timing of professional development among those reaching each destination office over the period of study. The figures indicate the number and share of individuals with at least 10 years of public service or three public offices before and during their service in each office. These figures indicate that for an increasing share of politicians, professionalization was occurring prior to entering the destination office. In contrast to theories of institutionalization, which link rising careerism to internal changes, those who reached high office were increasingly already

professional politicians. It is true that many others did cross the professional threshold during their stay in Congress, the cabinet, etc. Nonetheless, for an increasing majority of members, little additional persuasion was needed for a long career in politics. The figures are even more dramatic for federal judges and mayors, where professionalization during the pre-destination career increased dramatically between the third and fifth cohorts. The increase was less dramatic for the pre-gubernatorial career. For the pre-cabinet career, the level of professionalism actually declined, further reflecting the deterioration of this office as a realistic destination for ambitious politicians.

It is possible that institutionalization indirectly contributed to the length of the pre-destination career by increasing the wait times for entering high public offices. With more members of Congress, judges, etc., enjoying longer stints in office, there were fewer vacancies available, forcing many qualified politicians to wait their turn. Were these pre-destination careers also characterized by greater specialization over the period of study? Accounts that rely solely on institutionalization imply that specialization occurs after individuals reach their destination office. Those focusing on professionalization, in contrast, suggest that specialization begins prior to entering these offices. The political careers of those entering the six high offices studied here ought to exhibit greater separation in later cohorts, when professional politicians comprised the vast majority of those serving. The path to the Senate and House, for example, ought to be increasingly different from the path to a federal judgeship, the path to City Hall and the path to the statehouse.

Table 4.3B. Professionalization By Era – Governor, Federal Judge and Mayor

Era[a]		Governor			Federal Judge			Mayor		
		Before	During	Other[b]	Before	During	Other[b]	Before	During	Other[b]
1	%	69.42	20.66	9.92	63.04	28.26	8.70	47.62	33.33	19.05
	N	84	25	12	29	13	4	10	7	4
2	%	58.90	33.56	7.53	40.54	40.54	18.92	34.04	32.98	32.98
	N	86	49	11	15	15	7	32	31	31
3	%	53.76	36.02	10.22	36.25	50.00	13.75	31.03	36.78	32.18
	N	100	67	19	29	40	11	27	32	28
4	%	59.93	25.00	15.07	51.54	39.69	8.76	46.10	33.33	20.57
	N	175	73	44	100	77	17	65	47	29
5	%	58.27	29.50	12.23	55.51	38.58	5.91	50.00	27.08	22.92
	N	81	41	17	141	98	15	24	13	11
Total	%	59.50	28.85	11.65	51.39	39.77	8.84	40.41	33.25	36.34
	N	526	255	103	314	243	54	158	130	103

[a] See Table 4.1 for years captured in each era.
[b] Combines individuals professionalized after service in destination office or never professionalized at all.
NOTE: Cell entries indicate for each office, era and stage of the political career the number of percentage of incumbents with 10 years or more of public service or three or more public offices.

Did the paths to these six destination offices develop increasing separation (i.e., specialization) as the political career became longer over the period of study? To answer this question, it is necessary to devise a measure for comparing the career sequences of individuals prior to reaching their destination office. In the next section, I describe an optimal matching procedure that calculates a "distance" measure that assesses the differences among career sequences. In contrast to traditional measures that simply indicate whether a certain office was occupied or the length of such service, this distance

measure comprehensively assesses differences in the number, type and order of offices occupied.

5. Measuring Differences in Career Sequences Using Optimal Matching

The problem of measuring differences (i.e., distances) between sequences is solved by a dynamic programming technique called optimal matching. In the version of optimal matching used here, two elementary operations are used to transform one sequence into another. The sequences consist of strings of well-defined elements that can, but need not repeat. The first operation, *replacement*, involves replacing one element with another element. For example, with a simple replacement of the letter "M" with the letter "R," the sequence "MIGHT" is transformed into "RIGHT." The second operation, *insertion-deletion*, involves inserting or deleting an element from a sequence. Deleting the letter "S" from "SPARK" transforms this sequence into "PARK." Conversely, "PARK" can be transformed into "SPARK" with the insertion of the letter "S." Insertion and deletion are equivalent operations and are collectively called *indel*.

The distance (or difference) between two sequences is a function of the number of these elementary operations. Two sequences that require a large number of replacements and indels to transform one into the other are said to be further apart (i.e., more different) than two sequences that require a small number of operations. For complex sequences, there is typically more than one way to effect a transformation. The minimum distance, defined in terms of the number of elementary operations needed to transform one sequence into another, is referred to as the edit or Levenshtein distance (Levenshtein 1966).

Figure 4.1 provides a solution for transforming the Hay sequence into the Frelinghuysen sequence. The first two operations involve inserting elements "K" (local law enforcement) and "B" at the beginning of the Hay sequence, to compensate for Frelinghuysen's longer pre-cabinet career. In steps 3, 4 and 5, element "F" (federal administrative) is replaced with "E" (state executive). Steps 6 and 7 replace element "D" with "E," while steps eight and nine replace "D" with "S" (senate). Steps 10 through 16 involve other replacement operations, including "F" with "S," "D" with "S," and, finally, "C" with "S." One question that must be answered in calculating a pairwise distance for these two careers is whether the costs of these different replacement operations will be equal. Should the transition between federal administrative and state executive positions, for example, be weighted the same as one between a federal diplomatic post and the U.S. Senate? Another question that must be answered is whether these replacement costs will be the same as or different from the cost of adding additional years of service to the Hay sequence? The answers to these two questions give shape to sequence comparison.

The OM procedure uses the Needleman-Wunsch algorithm (Needleman & Wunsch 1970) to find the least cost solution given the weights assigned by the researcher to various replacement and indel operations. In Figure 4.1, for example, suppose all replacement and indel operations were assigned a cost of 1. Then the least cost solution of transforming the Hay sequence into the Frelinghuysen sequence would involve 16 steps, for a total cost of 16. The OM algorithm does allow the researcher to distinguish among replacement operations and assess different costs for replacements and indels. Since any replacement can be achieved via one deletion and one insertion, setting the cost of indels at less than half of the cost of replacements ensures that the algorithm will use

only indels in making a transformation. The various costs of replacements and indels are assembled in a matrix of substitution costs.

5.1 Optimal Matching with Substitution Costs

Specifying substitutions costs is the central theoretical exercise in sequence analysis (Brzinsky-Fay, Kohler & Luniak 2006). In setting costs, the analyst must rely on substantive knowledge of the subject matter. While the absolute magnitude of the costs does not matter, the relative costs of replacement and indel operations give structure to sequence comparison. The OM algorithm is an exploratory tool. Used properly, it can illustrate patterns in sequence data that are difficult to find through traditional methods. Like all statistical methods in the social sciences, however, the tools of sequence analysis are no substitute for detailed knowledge of the phenomenon being studied (Macindoe & Abbott 2004).[19]

Past studies of political careers (Schlesinger 1966; Bogue et al. 1976) differentiate public offices by level of government (e.g., local, state, and federal) and the tasks or functions that an incumbent performs (e.g., administrative, executive, judicial, and legislative). I adopt these two primary distinctions in setting substitution costs here. In particular, I first assume that any two offices with identical job types can be substituted

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[19] In contrast to the theoretical approach used here to assign substitution costs, some scholars refuse to distinguish among possible substitutions (Dijkstra & Taris 1995). Practically, this is akin to assuming that any transition, be they between offices, income categories or events, is just as likely as any other. Other researchers have tried a purely empirical approach, using observed transition rates to assign costs of replacing one state with another (Rohwer & Potter 2005). Observed transition rates, however, reflect initial distributions of offices and officeholders as well as the costs of making individual transitions. Transition rates for extremely rare transitions, for example, can unduly affect the minimization process. For many applications, it might also be unclear whether observed data adequately represent the true transition probabilities. Finally, it is possible that observed transition rates will vary over a period of study. Neither the agnostic solution (no differentiation between replacement costs) nor the empirically-driven method is particularly appealing here.

for each other at no cost. However, any substitution of one job type with another incurs a basic penalty of 1. Thus, any two local administrative jobs are substitutable at no cost; but substituting a local administrative with a local law enforcement job entails a cost of 1. Second, I assume that transitions within each level of government are easier to achieve than transitions between levels of government. Thus, an additional cost of 1 is assigned to replacements of: 1. a federal with a state job, 2. a federal with a local job, or 3. a state with a local job. Finally, I assume that transitions between jobs with similar functions are easier to achieve than transitions involving jobs with dissimilar functions. Thus, I assign an additional cost of 1 to replacements that involve transitions between administrative, executive, judicial and legislative functions.

None of these assumptions is likely to be exactly true in the real world. Term lengths and regular elections make it difficult to persist in an elective post. Similarly, both empirical research and common sense suggest that transition probabilities are likely to be asymmetric. A member of Congress, for example, is likely to find the transition to a state legislative post easy to pull off. The transition from the state legislature to Congress, on the other hand, can be exceedingly difficult. Some assumptions, however, are necessary to structure the algorithm so that it produces meaningful distances for analysis. As discussed above, sequence analysis is an exploratory tool and the efficacy of any assumptions about substitution costs must be weighed against the results they produce. The cost assumptions made here are grounded in past empirical work and are intended to be first approximations of the costs associated with transitions between various public-sector jobs in the U.S. federal system.

In addition to the replacement costs (which vary from 0 to 3) described above, each indel operation was assigned a cost of 1.5, or one-half of the mostly costly replacement. Setting the indel cost too low would render the other costs superfluous, as any replacement can be effected via one deletion and one insertion. So, for example, the cost of replacing a local legislative post for a cabinet position, as unlikely a transition as one can imagine, is set at 3 (the basic replacement cost of 1, an additional cost of 1 for the transition between levels of government, and an additional cost of 1 for the transition between functions). The same transformation can be accomplished by deleting B and inserting C. Similarly, the cost of replacing a federal judicial post with a state judicial post is set at 2 (1 for changing job types plus 1 for changing levels).

Using the OM algorithm, I calculated the minimum cost of transforming one sequence into another for every pairwise combination of career sequences (17,895,153 pairwise combinations). The algorithm returned a matrix of distances that captures differences in the careers of all 5,983 individuals in the dataset. Since political careers vary substantially in length, the unstandardized distances are likely to be heavily influenced by the disparity in sequence lengths. The potential distance between a short and long sequence is greater than for two sequences of equal length (Brzinsky-Fay, Kohler & Luniak 2006). I correct for this problem by dividing each pairwise distance by the length of the longest sequence in the dataset (52 years). These standardized distances, which capture the basic differences in office-holding experiences prior to entering each destination office, form the raw material for the analyses below.

6. Career Distances by Offices and Era

The OM algorithm returns a matrix of distances that captures the pairwise differences in the political experiences of individuals prior to assuming each of the six offices studied here – the "pre-destination" career. The absolute magnitude of these raw distances is uninformative, reflecting as they do the costs of various substitution and indel operations. Nonetheless, the relative size of the raw distances can reveal a great deal about the character of the pre-destination career across offices and changes in these experiences over time. In particular, these distances allow me to assess whether the emergence of professional politicians in the late 19th and early 20th centuries was accompanied by greater specialization, i.e., larger differences in the paths to high public offices.

Tables 4.4A, 4.4B and 4.4C present average within-group and between-group distances for the pre-destination career for all six offices. For each office and historical era, I calculated the difference between the average within-group and average between-group distances and performed paired sample t-tests of these differences. Separation in the paths to high office is denoted by a combination of small within-group distances and large between-group distances. Relatively small within-group distances indicate homogeneity among individuals reaching the office in the paths they took to get there. When the average within-group distance is substantially smaller than its corresponding average between-group distance, it suggests that the path to that office is distinct from the paths leading to other offices.[20]

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[20] The reasoning and procedures for testing within-group and between-group differences are from Abbott (1986).

Table 4.4A. Within- and Between-Group Distances by Era, Senate and House

	Senate						House				
Era	w/in	btw	dif	t-stat		Era	w/in	btw	dif	t-stat	
1	.536	.483	.053	2.34	***	1	.543	1.025	-.482	-10.03	***
2	.439	.417	.022	1.21		2	.480	.781	-.302	-9.22	***
3	.456	.460	-.004	-0.21		3	.658	.935	-.277	-7.81	***
4	.505	.561	-.057	-4.40	***	4	.593	.882	-.289	-8.66	***
5	.662	.661	.001	0.04		5	1.045	1.304	-.259	-5.77	***

* p<.10; ** p<.05; *** p<.01

Table 4.4B. Within- and Between-Group Distances by Era, Cabinet and Judges

	Cabinet						Federal Judge				
Era	w/in	btw	dif	t-stat		Era	w/in	btw	dif	t-stat	
1	.733	.616	.117	2.76	***	1	.636	.594	.041	1.12	
2	.622	.537	.086	3.31	***	2	.473	.491	-.018	-0.48	
3	.577	.536	.042	1.77	**	3	.469	.549	-.080	-2.82	***
4	.426	.521	-.095	-3.28	***	4	.538	.670	-.132	-7.82	***
5	.521	.634	-.112	-2.87	***	5	.590	.669	-.079	-4.46	***

* p<.10; ** p<.05; *** p<.01

Table 4.4C. Within- and Between-Group Distances by Era, Governor and Mayor

	Governor						Mayor				
Era	w/in	btw	dif	t-stat		Era	w/in	btw	dif	t-stat	
1	.532	.502	.030	1.39	*	1	.478	.524	-.106	-1.97	**
2	.482	.435	.046	2.76	***	2	316	.403	-.087	-3.66	***
3	.436	.458	-.022	-1.25	**	3	.310	.420	-.110	-4.62	***
4	.430	.543	-.113	-7.63	***	4	.428	.567	-.139	-6.53	***
5	.480	.631	-.151	-6.15	***	5	.523	.651	-.128	-3.00	***

* p<.10; ** p<.05; *** p<.01

What do the distances in Tables 4.4A, 4.4B and 4.4C reveal? Not surprisingly, the largest within-group distances are registered by those serving in the cabinet and Senate. These two offices constituted the top rung of the U.S. office-holding system over the period of study. Most cabinet and Senate incumbents had long political careers prior to assuming these offices. Over the first three cohorts, the average within-group distance is larger than the average between-group distance, indicating substantial heterogeneity in the paths to these two offices. Cabinet officers and senators had pre-destination careers that often had less in common with each other than with politicians serving elsewhere.

Members of the House and big-city mayor had the most consistently homogenous pre-destination careers. In each of the five historical eras, the average within-group distance is smaller than the average between-group distance. The pre-destination careers of federal judges were also consistently different from those of other politicians. In four of the five cohorts, the average within-group distance was smaller than the average between-group distance. Differences between the two increased over the period of study. The least consistent pattern was registered by governors. During the first two cohorts, the average within-group distance was smaller than the average between-group distance. In the third, fourth and fifth eras, the average within-group distance is significantly smaller than the average between-group distance.

With respect to time, some of the largest within-group and between-group distances are to be found among individuals in the first historical era. This is consistent with the trends depicted in Figures 4.2, 4.3, 4.4 and 4.5. Professional politicians frequently occupied these offices during the Early Republican Era, reflecting perhaps

legal and economic constraints that limited public service to the privileged few. More surprising are the large within-group and between-group distances registered by individuals serving during the New Deal. The careers of politicians serving in this later cohort display remarkable heterogeneity.

The figures in these tables provide ample evidence of separation in the paths to high offices. For most of the six destination offices, there is a sizable decrease in the average within-group distance between the first and third cohorts, followed by an uptick in the last era. For a couple offices, e.g., the House, Senate and mayor, this uptick begins sooner. In contrast, the average between-group distance for each of the six offices increased between the second and fifth eras. The combination of decreasing within-group and increasing between-group distances implies that the career paths to all six offices were developing greater internal consistency while becoming more distinct from the paths to other offices.

During the fourth historical era, professionalization appears to have reached a high point. For all six offices, the difference between the average within-group and average between-group distances is negative, large and statistically significant. The same is true for the last cohort, with the exception of the U.S. Senate, where the disparity disappears. These results are impressive given the lengthening of both the pre-destination and office-based careers at the end of the period of study. These figures indicate that the pre-destination career was increasingly a specialized one. The political experiences of politicians reaching the federal bench were steadily diverging from the experiences of those elected to Congress, appointed to the cabinet or assuming control of state and local governments.

Table 4.5 contains the results of an analysis of variance (ANOVA) procedure that assesses the contribution of "office" and "era" in explaining differences among the pre-destination career. The dependent variable is the average total distance for each of the 3,946 individuals in the dataset.[21] The independent variables are dummies for the six offices and five historical eras. The effects of the office grouping are strong. By itself, the office grouping explains more than one-fifth (21 percent) of the variance in the pre-destination career. The historical groupings explain another two percent. These results testify to the distinctiveness of the pre-destination career, an important feature of professionalization that theories that rely solely on internal changes, i.e., institutionalization, can neither predict nor explain.

Table 4.5. Results of ANOVA on Pre-Destination Career Distances

Source	Partial SS	df	MS	F	Prob > F	% Variance
Model	18.426	9	2.047	156.94	0.000	26.41
Office	15.227	5	3.045	233.45	0.000	21.82
Era	1.657	4	0.414	31.75	0.000	2.38
Residual	51.347	3936	0.013			73.59
Total	69.773	3945	0.018			

Note: N = 3946; Adj. R-squared = .262.

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[21] To reduce computing time and economize on the size of the matrix needed to hold pairwise distances for all six offices, I randomly selected 1,004 or the 3,041 House careers for the purposes of this analysis. Thus, the total number of individuals included in the analysis is 3,946, not the 5,983 identified in Table 1. This sampling scheme reduced the number of unique distances from 17,895,153 to 7,783,458.

7. Conclusion

The findings presented here cast doubt on institutionalization as a coherent and complete explanation for rising careerism in the U.S. in the late 19th and early 20th centuries. Internal explanations cannot explain why tenure in office increased not just in the halls of Congress, but across the U.S. federal system. Theories that focus on professionalization, including the development of increasingly elaborate and specialized paths to office, appear to better account for several patterns revealed here. First, the length of service among individuals occupying each of the six destination offices studied here increased dramatically. Second, professionalization was increasingly occurring at the pre-destination stage of the political career. More individuals arrived in these offices having already compiled substantial political resumes. They needed no additional inducements to make a career in politics. Finally, the pre-destination career, i.e., the career paths to each office, was becoming more specialized. By the 1890s, the path to these six offices was being travelled mostly by specialists.

What factors can account for these patterns? A thorough analysis of this question is beyond the scope of this study and, perhaps, beyond the capacity of the data gathered here to answer. Future work can address this question by building on the data collected here and the sequence analysis methods used to measure differences among career sequences. Better data and methods can help arbitrate between three potential explanations for the findings reported here. The first explanation relates changes in career patterns to changes in the attributes of the individuals occupying these six offices. One such change was increasing lifespan. With more years added to the working life, individuals could spend additional time in all offices. Preliminary analyses (not shown)

indicate that time spent in public office tracked increases in the working life closely for each office.

A second explanation focuses on structural factors. Between the end of Reconstruction and the World War II era, government activity at all levels expanded exponentially. The nationalization of public authority over this period made service in the federal offices relatively attractive even as it placed greater demands on those who served. Similarly, the growth in the size of state and urban populations, and increasingly complexity of the problems facing state and local governments put a premium on executive leadership positions like governor and mayor. Whereas these positions, and the House, had traditionally served as way-stations for ambitious politicians seeking national prominence, they quickly became destination offices in their own right. The share of those exiting public service after occupying each of these six positions increased markedly over the period of study.

Finally, a third explanation highlights institutional changes that altered the relative values of public offices and reshuffled the structure of political opportunities facing ambitious politicians. In the Early Republican Era, for example, the path to high office was blocked by substantial barriers to entry to all but a chosen few. Property qualifications, the remoteness of state capitals and Washington, and the low salaries offered to public servants placed public service beyond the reach of most Americans. Similarly, between the fourth and fifth cohorts, there was a shift from party-centered to candidate-centered electoral system institutions, including implementation of the secret ballot and direct primaries (Rusk 1970; Katz & Sala 1996; Merriam & Overacker 1928).

Moreover, longer term lengths for governors and mayors lengthened incumbents' stays in office.

Given the breadth and scope of political professionalization, no single set of explanations is likely to be sufficient. Future work ought to attend to these main competing explanations and assess the contribution of each to rising careerism and increasing specialization. Toward this end, the sequence analysis methods used here provide a powerful new tool for studying patterns among political careers. These methods can be used to improve existing measures of previous political experience and diagnose broad changes in the career paths to particular offices. In contrast to existing measures, the distances calculated by the OM algorithm comprehensively assess differences in the number, type and order of offices occupied.

Chapter 5

Big City Ambitions:
Individual Characteristics, Political Institutions and the Pathways to City Hall

"What is inherently wrong with the word 'politician' if the fellow has devoted his life to holding public office and trying to do something for his people?" – Richard J. Daley, Mayor of Chicago

Robert Louis Stevenson once remarked that "politics is perhaps the only profession for which no preparation is thought necessary." The notion that the work of government can be and, according to some, ought to be performed by ordinary citizens has been an undercurrent of political thought since before the age of Jackson. However, as John Stuart Mill and others have observed, a fundamental tension exists between participatory and rational government (Mill 2008 [c.1861]). Putting ordinary citizens in charge ensures that decisions will be representative, but at the risk that the best course of action will not be taken. The Farmers similarly believed that no constitution could protect a nation against widespread incompetence or immorality among its political leaders. They therefore designed republican institutions to increase the likelihood of selecting men with good character and ample experience to public office.

Empirical studies of the political career have much to contribute to theoretical debates about representation. They can, for example, establish whether public offices are occupied by individuals with no experience (amateurs) or lengthy political resumes (professionals). Career studies can also uncover whether individual characteristics and aspects of the institutional setting make some career paths more likely. Given their theoretical import, one might think that such empirical questions would be settled for

most high offices in the U.S. Writing in the 1950s, Matthews (1954) found that political scientists knew little about the usual pattern or sequence of offices leading to the presidency and Congress. In the intervening decades, nothing has happened that would fundamentally alter this pessimistic assessment. Indeed, in recent years, researchers have tended to ignore the pattern question altogether, focusing instead on individual-level models of career decision-making.

One potential explanation for this knowledge gap is the difficulty of defining the political career and identifying career paths. Indeed, some scholars deny that individuals' involvement in politics follow any discernible patterns at all.

> In American politics the escalator to the top is not a regimented, orderly lift, but a tangle of ladders, ropes, and runways that attracts people from other activities at various stages of the process, and leads others to a dead end or a blind drop (Lasswell 1960).[22]

That the sequence of events that forms a political career resists simple classification and measurement is indisputable. Political careers are more irregular than other types of careers. Any regularities that do exist are encoded in complex sequences of office-holding events. Compared to this empirical complexity, most measures of political experience are crude. The most comprehensive dataset on congressional careers (McKibbin 1997), for example, collapses career sequences into a series of binary indicators. In doing so, information about the order, number and type of offices occupied is irretrievably lost.

In recent years, statistical techniques have been developed that facilitate the analysis of complex sequences of events. In this paper, I demonstrate the usefulness of

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[22] I first ran across this quote in Prinz's (1993) excellent overview of the careers literature.

sequence analysis methods (Abbott 1995; Macindoe & Abbott 2004) for making sense of office-holding sequences. Specifically, I apply an optimal matching algorithm to newly collected data on mayoral careers in 15 large U.S. cities from 1820 to 1980.[23] This algorithm produces a matrix of distances that capture differences among mayors in the order, number and type of offices they occupied prior to becoming mayor. These distances are then analyzed using cluster analysis to identify meaningful groupings, i.e., career paths, in the data. Substantively, I show that the pre-mayoral career can be partitioned into a few, recognizable career paths. I also demonstrate that differences in the path followed to the mayor's office can be related to both individual characteristics and the local institutional setting.

This paper proceeds as follows. In the next section, I briefly review past work on political careers, focusing on attempts to identify the paths to various public offices. The third section describes how career sequences for mayors were collected and coded. I then introduce sequence analysis techniques and the optimal matching (OM) algorithm used to distinguish differences in sequences of events. The fourth section analyzes the inter-sequence distances returned by the OM algorithm, assessing whether different cities support distinct paths to the mayor's office. The fifth section describes the cluster analysis procedures used to partition the distances returned by the OM algorithm into meaningful groups, or career paths. The sixth section introduces a statistical model of the pre-mayoral career, showing that career paths can be related to both individual attributes

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[23] Focusing on mayors has several advantages. First, there are far fewer big city mayors than governors, senators or representatives. Second, the office has changed substantially over time. So has the background and experiences of those reaching the mayoralty (Dahl 1961). Third, compared to other offices in the U.S. federal system, mayors have received little attention. To my knowledge, this is the first systematic study of pre-mayoral career paths.

and the local institutional setting. The final section concludes with a discussion of the potential that sequence analysis methods have for career studies and other sequential data of interest to political scientists.

1. Existing Research on Political Careers

Schlesinger's landmark study, *Ambition and Politics* (1966), is the most detailed effort to address the knowledge gap identified by Matthews (1954). Schlesinger examined the political careers of presidents and vice presidents, cabinet members and Supreme Court justices, emphasizing the position occupied just prior to these destination offices. His findings were fairly conventional. Most presidents, vice presidents and nominees emerge from other elective offices; cabinet members tend to rise from lesser posts in the federal bureaucracy; Supreme Court members advance from lesser legal posts. Schlesinger also studied governors and senators, producing elaborate frequency trees that map out the paths to each office between 1900 and 1958. He found that most candidates for these offices used relatively few paths.

Unfortunately, Schlesinger's attempt to link career paths to features of state opportunity structures was less successful. Schlesinger did find that politicians in northeastern and Midwestern states made extensive use of state legislative offices, while those in the West favored law enforcement positions. Democrats appeared to have more "political" careers than Republicans, though it is unclear why. Schlesinger offered only anecdotal evidence for the manifest hypothesis – i.e., transitions between offices sharing manifest conditions will be more frequent. Moreover, to accumulate a sufficiently large number of careers to calculate state-level opportunity rates, the entire 1900-1958 period

is lumped together. Thus, Schlesinger did not assess whether career paths had changed over time. Nor is there a detailed analysis of how institutional reforms, such as primary elections, impacted political career patterns.

Mezey (1970) duplicated parts of Schlesinger's analysis for the U.S. House. He uncovered 20 distinct paths to the office, but found no relationship between turnover in the state party system and the political experience of representatives. Kernell (1981) took up Schlesinger's claim that a hierarchy of public offices, characterized by orderly career paths, existed in the U.S. Using data on the career choices of four House cohorts spread over the period 1817 to 1902, Kernell concluded that the status of the House increased markedly during the 19th century. Increasing status was not accompanied, however, by development of an elaborate pre-congressional career. Kernell speculated that decreasing Senate turnover and the declining status of state offices left few opportunities for House members to realize progressive ambitions.

Career paths have received less attention outside of the U.S. In a review of the comparative literature on recruitment and retention, Patzelt (1999) concludes that while much work has been done to illuminate the effects of electoral system institutions on party strategies and electoral campaigns (see, for example, Taagepera & Shugart 1989; Carey & Shugart 1995; Cox 1997), there are few studies of the attractiveness of political careers relative to other leadership opportunities. Moreover, he finds that researchers have paid insufficient attention to how regime structure affects recruitment. The role of federal, presidential, semi-presidential and parliamentary structures in making legislative and other careers more or less attractive remains an unstudied question in comparative politics.

Notable exceptions include Rush's (1994) study of career paths leading to ministerial positions in Great Britain, and Scarrow's (1997) analysis of the European Parliament. Rush notes that ministerial positions are now pursued entirely through the House of Commons and the two major parties. Members' chances depend almost entirely on the frequency of elections and the prospects of their party. Scarrow finds that service in the European Parliament typically plays one of three roles in the careers of its members: 1. a political dead end, 2. part of a long domestic career, or 3. part of a European career. She finds that the share of those falling into the third category has increased, and predicts that, as a result, the European Parliament might ultimately seek greater independence from national governments.

Researchers are also beginning to study how regime structure shapes political careers. The best example is Samuels (2003), which examines the impact of Brazil's federal structure on the ambitions of its national legislators. Like Schlesinger, Samuels argues that a hierarchy of offices exists in Brazil. The Brazilian political hierarchy, however, looks different than its U.S. counterpart. State and even local executive offices enjoy greater prestige than service in the national Chamber of Deputies, presumably because the former afford control over patronage resources. With members having little inclination to build careers within the national assembly, institutionalization there has languished. Party leadership positions are weak. Committee slots are not assigned according to the seniority norm, making legislative service both less predictable and less valuable. Samuels also shows that legislative campaigns are typically organized around gubernatorial rather than presidential contests. Gubernatorial coattail effects are strong in Brazil, giving governors an inordinate sway over legislators from their states.

Needless to say, the career paths of big-city mayors in the U.S. have received almost no attention. Most studies of the mayoral career are either biographical or focus on a single administration or locale. The systematic studies that have been published depict the office as a dead-end job (Gittell 1963; Murphy 1980). One exception is McNitt (2003) who documents a sharp rise in tenure among big city mayors and relates tenure to performance in office. In general, much recent work in urban politics eschews large-*N* comparative analysis altogether.[24] Comparative case studies are more common. The dearth of systematic studies of local careers and other political phenomena contributes to a balkanized approach whereby researchers view each city as a political system that is *sui generis*.

Efforts to study career sequences have been hampered by shortcomings in the traditional statistical methods used to study political careers. These methods (e.g., regression, time series and event history analyses) require the analyst to model decisions made over the course of a career as a series of independent events produced step-by-step by a data generating process. In recent years, however, advanced methods for studying patterns in sequences have become available for use by social scientists. In particular, sequence analysis methods developed by molecular biologists studying DNA sequences are now being used to study a range of sequential phenomena of interest to political scientists, economists, and sociologists. These methods enable the analyst to uncover

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[24] This trend is in stark contrast to an earlier generation of career studies that saw diverse local settings as an opportunity to study political recruitment and professionalization using large-*N* surveys of local politicians. The best known example of this approach is the City Council Research project directed by Heinz Eulau in the 1970s. The comprehensive surveys collected by this project provided empirical data for Eulau & Eyestone's (1968) study of the relationship between the local environment and public policies, Prewitt's (1970) analysis of legislative recruitment and role orientation, and Black's (1970) study of professionalization.

patterns in complex sequences of events and, as such, are ideally suited for examining patterns among political careers.

2. Sequence Methods

Sequence analysis refers to a body of methods that take whole sequences of events as units of analysis, rather than treating each event as an individual data point. In this way, sequence analysis differs from time series methods, which treat a series of events as generated step-by-step via a stochastic process. Stepwise approaches, such as first-order Markov processes and event history analysis, have been the standard methods applied to sequential data in the social sciences (see Abbott 1995). These methods, however, require assumptions about the relationship between adjacent events, and usually ignore information about the ordering of events. Sequence analysis methods can be applied to any ordered listing of events and have been used to study careers (i.e., sequences of jobs), lifecycles (sequence of life events, e.g., education, work, retirement) and social phenomena (e.g., sequences of elements in dance performances).

Sequence analysis proceeds in four steps. In the first step, data describing sequences of events, in this case a series of office-holding events, are coded and formatted for analysis. In the second step, an optimal matching (OM) algorithm is used to calculate a distance measure between sequences of events – in this case, pre-mayoral careers. In the third step, exploratory techniques, such as cluster analysis and multi-dimensional scaling, are used to group similar sequences together, in this case similarities among the paths followed to the mayoralty. Finally, these groupings of sequences are used as independent or dependent variables in statistical analysis. Here, I study changes

in pre-mayoral career paths over time and relate these paths to both individual characteristics and the local institutional setting. This rest of this section briefly describes the first two steps: data coding and formatting, and the application of the OM algorithm to pre-mayoral career sequences.

2.1 Data and Coding

The data used in this study consist of complete career sequences and other information for 676 mayors listed in the *Biographical Dictionary of American Mayors, 1820-1980* (Holli and d'A. Jones 1980). The *Dictionary* describes the background, employment history, electoral experiences and public accomplishments of every individual holding the office of mayor in 15 leading American cities between 1820 and 1980. Entries for some mayors are more extensive than others, reflecting the difficulty of compiling information on mayors who occupied the office for a short time and left little historical imprint on the cities they governed. Nonetheless, these entries, written by more than 100 scholars working with local archival materials and secondary sources, constitute the most complete source of data on mayoral careers.

The 15 cities are Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Detroit, Los Angeles, Milwaukee, New Orleans, New York, Philadelphia, Pittsburgh, San Francisco and St. Louis. They are not a random sample of all cities, or even large U.S. cities. In selecting their cases, the editors opted for those cities "that have maintained consistent leadership in population and historical importance since the 1820s." The sample includes more Northeast and Midwest cities than West Coast and Sunbelt cities. Several of the fastest growing cities over the past 30 years, such as Dallas, Houston,

Phoenix and San Diego, were not included. Many of these southwestern cities utilize the council-manager plan, under which the mayor is a ceremonial post with little control over the budget and everyday operations. Of the 15 cities included here, only Cincinnati used the council-manager plan for any significant amount of time.

Table 5.1 provides a breakdown of mayoral careers by city and historical era. The entire 1801-1980 period was broken up into nine 20-year intervals. The 1801-1820 and 1821-1840 periods were then grouped together to form the eight categories shown. Mayoral careers are spread relatively evenly across cities, with some variation due to the later founding of cities like Los Angeles and San Francisco. The distribution of mayoral careers across historical eras is uneven, with more mayors serving prior to 1900. This unevenness reflects changes in the length of the mayoral term, the preferences of voters and individual differences in career objectives. Each of these cities grew substantially in size, in some cases from less than 10,000 to well over one million, over the period of study. In a majority of the 15 cities, the length of the mayoral term increased from one to four years.

Table 5.1. Distribution of Mayoral Careers by City and Era

	1801-1840	1841-1860	1861-1880	1881-1900	1901-1920	1921-1940	1941-1960	1961-1980	Total
Baltimore	9	9	7	6	5	1	3	3	43
Boston	8	8	8	8	6	3	3	1	45
Buffalo	8	14	7	8	4	4	4	4	53
Chicago	4	13	8	6	3	4	2	2	42
Cincinnati	4	6	8	7	7	4	7	8	51
Cleveland	3	11	9	5	5	5	3	5	46
Detroit	12	11	8	6	5	9	3	3	57
Los Angeles		10	7	10	7	4	1	2	41
Milwaukee		10	11	7	4	1	3		36
New Orleans	8	6	19	5	2	6	1	3	50
New York	4	10	9	7	6	4	3	3	46
Philadelphia	1	7	3	6	5	5	3	3	33
Pittsburgh	9	13	6	7	7	4	3	2	51
San Francisco		14	7	7	5	1	3	4	41
St. Louis	4	12	8	5	3	2	4	3	41
Total	74	154	124	100	74	57	46	46	676

NOTE: Cell entries represent the number of individuals who first enter the office of mayor in each city during each era. These numbers are, therefore, less than the total number of individuals serving during each era.

The procedures used for assembling the sequence of public offices held by each mayor and calculating the distances between them encompassed three steps. In Step 1, biographical information was transferred from the *Dictionary* to a database file.[25] Each public-sector job that an individual mayor held was entered in the order it was occupied.

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[25] Database programs like FileMaker Pro allow coders to design interfaces that use check-boxes, radio buttons, pull-down menus and authentication routines. These tools help minimize typing and other coding errors. Most of the information in the dataset was entered by the author with the assistance of several undergraduate students.

Start and end dates for each office were recorded along with information about the age, education, non-public occupations, political party affiliation and electoral experiences of each mayor.

In Step 2, public-sector jobs were further assigned one of 20 values from a typology of local, state and federal offices. Table 5.2 reproduces the typology of offices used here. Each office type was given a letter code to distinguish it from other types. Federal law enforcement offices were all assigned the letter "L." Service in the state legislature is denoted by the letter "R." In Step 3, the sequence of public offices for each mayor was constructed by assembling an "office-year string" for every office in the public career. Each string consists of a letter code for the office repeated once for each year the individual occupied the office. If a mayor served in the state legislature for four years, then the string "RRRR" would be added to the sequence. For each mayor, the office-year strings were then concatenated in the order of offices occupied to form a final career sequence.

Table 5.2. Classification of Public Sector Jobs

Level	Function			
	ADMINISTRATIVE	EXECUTIVE	JUDICIAL	LEGISLATIVE
FEDERAL	Administrator (F) (*Counsel, FTC*)	President (X)	Federal Judge (J) (*Associate Justice, U.S. Court of Appeals*)	Representative (H)
				Senator (S)
	Law Enforcement (L) (*U.S. Attorney*)	Cabinet Officer (C) (*U.S. Attorney General*)		
	Diplomat (D) (*Minister to Italy*)			
STATE	Administrator (A) (*Director, State Equalization Board*)	Governor (G)	State Judge (W) (*Chief Justice, Supreme Court of Ohio*)	State Legislature (R)
	Law Enforcement (U) (*District Attorney*)	State Executive (E) (*Secretary of State*)		
LOCAL	Administrator (Q) (*Director, Parks Department*)	Mayor (M)	Local Judge (V) (*Probate Judge*)	City Council (B)
	Law Enforcement (K) (*Police Officer*)	Local Executive (T) (*Deputy Mayor*)		

Note: Letters in parentheses are letter codes used to denote different job types. Positions in italics are examples of the various job types.

Victor Schiro, New Orleans

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Q   B   B   B   B   B   B   B   M̲   M̲   M̲   M̲   M̲   M̲   M̲   M   M

L   L   H   H   H   H   H   H   M̲   M̲   M̲   M̲   M̲   M̲   M̲   φ   φ
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John Lindsay, New York

B = Local Legislative; L = Federal Law Enforcement; H = House; M = Mayor;
Q = Local Administrative

Step 1: Replace element L with Q
Step 2: Replace L with B
Step 3: Replace H with B
Step 4: Replace H with B
Step 5: Replace H with B
Step 6: Replace H with B
Step 7: Replace H with B
Step 8: Replace H with B
Step 9: Insert M
Step 10: Insert M

Figure 5.1. Alignment of Career Sequences for Two Big City Mayors

Figure 5.1 shows complete sequences for two mayors in the dataset, John Lindsay

and Victor Schiro. The career sequence for John Lindsay combines three office-year

strings. Lindsay began his political career with a two-year stint in the U.S. Justice

Department during the Eisenhower Administration ("LL"). He was then elected to the

U.S. House, where he remained for three terms ("HHHHHH") before being elected

Mayor of New York. He was mayor between 1959 and 1965 ("MMMMMMM"), after

which he retired to a private legal career. Schiro was a successful insurance salesman

who began his political career with a one-year stint as Commissioner of Public Buildings

and Parks ("Q"). In 1954, he was elected to an at-large seat on the City Council of New Orleans, where he served for seven years ("BBBBBBB"). Schiro was chosen by his colleagues in 1961 to replace DeLesseps Morrison, who resigned to accept a diplomatic post. He was elected Mayor of New Orleans in his own right in 1962 and reelected in 1965, holding the office until 1970 ("MMMMMMMMM"). Following two terms in office, where he helped presided over the peaceful integration of the city, Schiro returned to his insurance business.[26]

2.2 *Optimal Matching*

The problem of measuring differences (i.e., distances) between sequences is solved by a dynamic programming technique called optimal matching. In the version of optimal matching used here, two elementary operations are used to transform one sequence into another. The sequences consist of strings of well-defined elements that can, but need not repeat. The first operation, *replacement*, involves replacing one element with another element. For example, with a simple replacement of the letter "O" for the letter "E," the sequence "PSYCHE" is transformed into "PSYCHO." The second operation, *insertion-deletion*, involves inserting or deleting an element from a sequence. Deleting the letter "G" from "GLOVE" transforms this sequence into "LOVE." Conversely, "LOVE" can be transformed into "GLOVE" with the insertion of the letter "G." Insertion and deletion are equivalent operations and are collectively called *indel*.

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[26] Schiro also presided over the response to Hurricane Betsy, which flooded the ninth ward and other parts of the city in 1965. He is perhaps best known for his reply to a reporter covering the tragedy: "Don't believe any false rumors, unless you hear them from me."

The distance (or difference) between two sequences is a function of the number of these elementary operations. Two sequences that require a large number of replacements and indels to transform one into the other are said to be further apart (i.e., more different) than two sequences that require a small number of operations. For complex sequences, there is typically more than one way to effect a transformation. The minimum distance, defined in terms of the number of elementary operations needed to transform one sequence into another, is referred to as the edit or Levenshtein distance (Levenshtein 1966).

Figure 5.1 provides a solution for transforming the Lindsay sequence into the Schiro sequence. The first operation involves replacing element "L" (federal law enforcement) with element "Q" (local administrative). The second replaces "L" with "B" (local legislative). The next six operations involve replacing "H" (House) with "B." Seven exact matches of "M" (mayor) are picked up after which two insertions of "M" are made to compensate for Lindsay's shorter mayoral tenure. One question that must be answered in calculating a pairwise distance for these two careers is whether the costs of the operations described in steps 1, 2 and 3 through 8 will be equal. Will the transition between federal law enforcement and local legislative positions be weighted the same as the transition between the House and a local legislature? Another question that must be answered is whether replacement costs will be the same as or different from the cost of adding additional mayoral years to the end of the Lindsay sequence? The answers to these two questions give shape to sequence comparison.

The OM procedure uses the Needleman-Wunsch algorithm (Needleman & Wunsch 1970) to find the least cost solution given the weights assigned to various

replacement and indel operations. In Figure 5.1, for example, suppose all replacement and indel operations were assigned a cost of 1. Then the least cost solution of transforming the Lindsay sequence into the Schiro sequence would involve 10 steps, for a total cost of 10. The OM algorithm does allow the analyst to distinguish among replacement operations and assess different costs for replacements and indels. Since any replacement can be achieved via one deletion and one insertion, setting the cost of indels at less than half of the cost of replacements ensures that the algorithm will use only indels in making a transformation. The various costs of replacements and indels are assembled in a matrix of substitution costs.

2.3 Optimal Matching with Substitution Costs

Specifying substitutions costs is the central theoretical exercise in sequence analysis (Brzinsky-Fay, Kohler & Luniak 2006). In setting costs, the analyst must rely on substantive knowledge of the subject matter. While the absolute magnitude of the costs does not matter, the relative costs of replacement and indel operations give structure to sequence comparison. The OM algorithm is an exploratory tool. Used properly, it can illustrate patterns in sequence data that are difficult to find through traditional methods. Like all statistical methods in the social sciences, however, the tools of sequence analysis are no substitute for detailed knowledge of the phenomena being studied (Macindoe & Abbott 2004).[27]

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[27] In contrast to the theoretical approach used here to assign substitution costs, some scholars refuse to distinguish among possible substitutions (Dijkstra & Taris 1995). Practically, this is akin to assuming that any transition, be they between offices, income categories or events, is just as likely as any other. Other researchers have tried a purely empirical approach, using observed transition rates to assign costs of replacing one state with another (Rohwer & Potter 2005). Observed transition rates, however, reflect initial

Past studies of political careers (Schlesinger 1966; Bogue et al. 1976) differentiate public offices by level of government (e.g., local, state, and federal) and the tasks or functions that an incumbent performs (e.g., administrative, executive, judicial, and legislative). I adopt these two primary distinctions in setting substitution costs here. In particular, I first assume that any two offices with identical job types can be substituted for each other at no cost. However, any substitution of one job type with another incurs a basic penalty of 1. Thus, any two local administrative jobs are substitutable at no cost; but substituting a local administrative with a local law enforcement job entails a cost of 1. Second, I assume that transitions within each level of government are easier to achieve than transitions between levels of government. Thus, an additional cost of 1 is assigned to replacements of: 1. a federal with a state job, 2. a federal with a local job, or 3. a state with a local job. Finally, I assume that transitions between jobs with similar functions are easier to achieve than transitions involving jobs with dissimilar functions. Thus, I assign an additional cost of 1 to replacements that involve transitions between administrative, executive, judicial and legislative functions.

None of these assumptions is likely to be exactly true in the real world. Term lengths and regular elections make it difficult to persist in an elective post. Similarly, both empirical research and common sense suggest that transition probabilities are likely to be asymmetric. A member of Congress, for example, is likely to find the transition to a state legislative post easy to pull off. The transition from the state legislature to

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distributions of offices and officeholders as well as the costs of making individual transitions. Transition rates for extremely rare transitions, for example, can unduly affect the minimization process. For many applications, it might also be unclear whether observed data adequately represent the true transition probabilities. Finally, it is possible that observed transition rates will vary over a period of study. Neither the agnostic solution (no differentiation between replacement costs) nor the empirically-driven method is particularly appealing here.

Congress, on the other hand, can be exceedingly difficult. Some assumptions, however, are necessary to structure the algorithm so that it produces meaningful distances for analysis. As discussed above, sequence analysis is an exploratory tool and the efficacy of any assumptions about substitution costs must be weighed against the results they produce. The cost assumptions made here are grounded in past empirical work and are intended to be first approximations of the costs associated with transitions between various public-sector jobs in the U.S. federal system.[28]

In addition to the replacement costs (which vary from 0 to 3) described above, each indel operation was assigned a cost of 1.5, or one-half of the mostly costly replacement. Setting the indel cost too low would render the other costs superfluous, as any replacement can be achieved via one deletion and one insertion. So, for example, the cost of replacing a local legislative post for a cabinet position, as unlikely a transition as one can imagine, is set at 3 (the basic replacement cost of 1, an additional cost of 1 for the transition between levels of government, and an additional cost of 1 for the transition between functions). The same transformation can be accomplished by deleting "B" and inserting "C." Similarly, the cost of replacing a federal judicial post with a state judicial post is set at 2 (1 for changing job types plus 1 for changing levels).

Using the OM algorithm, I calculated the minimum cost of transforming one sequence into another for every pairwise combination of pre-mayoral career sequences

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[28] To assess the importance of these costs assumptions, I compared the distances produced under different sets of substitution rules (results not shown). For example, I calculated distances where only transitions between jobs were penalized (i.e., no additional penalty for transitions between levels of government or job functions). I also calculated distances without an additional penalty for levels and without an additional penalty for job functions. The distances returned by the OM algorithm under these various costs assumptions correlate at .84 or above and, in most cases, .95 or above. Nonetheless, the matrix of substitution costs does shape the results of the clustering operations used to partition the distances returned by the OM algorithm. How important the various costs assumptions are, in general, to the results one obtains is a topic that warrants further theoretical and empirical study.

(228,150 pairwise combinations). The algorithm returned a matrix of distances that captures differences in the pre-mayoral careers of all 676 individuals in the dataset. Since pre-mayoral careers vary substantially in length, the unstandardized distances are likely to be heavily influenced by the disparity in sequence lengths. The potential distance between a short and long sequence is greater than for two sequences of equal length (Brzinsky-Fay, Kohler & Luniak 2006). I correct for this problem by dividing each pairwise distance by the length of the longest sequence in the dataset (44 years). These standardized distances, which capture the basic differences in the office-holding experiences prior to assuming the mayoralty, form the raw material for the analyses described below.

3. Career Distances across Time and Place

The OM algorithm returns a matrix of distances that captures the pairwise differences in the experiences of mayors prior to assuming the office. These distances form the input data for cluster analysis and multi-dimensional scaling programs. These programs enable the analyst to recover any relevant groupings or dimensions in the data. Can anything be said about the raw distances? Because the magnitude of the substitution costs imposed by the program is arbitrary, the absolute size of the distance between any two career sequences will be uninformative. What matters are the relative costs of various replacement and indel operations, and, hence, the relative size of the distances.

While the underlying clusters and dimensions are difficult to discern from the raw distances, the latter can be used to assess differences across pre-existing cohorts or other partitions in the data. In Table 5.1, the 676 mayoral careers were grouped by city and

historical era. Close attention to the distances can provide useful information on whether there is any clustering within these particular cohorts. Do politicians in these 15 cities follow distinct paths to the mayoralty? Does the typical path to the mayor's office change over the period of study? These empirical questions are of surpassing theoretical import. Clustering within city cohorts would draw attention to institutional and political settings within cities that give shape to political careers. Clustering within historical eras would highlight important developmental changes in the relationship between urban residents and the public officials that govern them.

How can such clustering be detected and measured? To the extent that a city or historical era supports a distinct path to the office of mayor, the pre-mayoral careers within these cohorts ought to resemble each another. Such resemblances, if they exist, will be captured in the inter-sequence distances within these cohorts. In particular, the average distances within cities and historical eras ought to be smaller than the average distances between them. If this is the case, it suggests a distinct career path or ordering of offices within the cohort. If there is no significant difference in the within-group and between-group distances, there is little evidence for a distinct career path. In this case, it suggests that an individual can reach the mayor's office from a variety of positions in the political system or that mayors in the cohort offer very different political resumes.[29]

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[29] The reasoning and procedures for testing within-group and between-group differences is from Abbott (1986).

Table 5.3. Within- and Between-Group Distances by City and Era

City	Within Group	Between Group	Era	Within Group	Between Group
Baltimore	.181	.178	1801-1840	**.140**	**.162**
Boston	.185	.184	1841-1860	**.103**	**.151**
Buffalo	**.155**	**.165**	1861-1880	**.109**	**.150**
Chicago	**.164**	**.168**	1881-1900	**.146**	**.162**
Cincinnati	<u>.193</u>	<u>.182</u>			
Cleveland	**.150**	**.163**	1801-1900	**.121**	**.203**
Detroit	<u>.195</u>	<u>.184</u>			
Los Angeles	**.158**	**.166**	1901-1920	<u>.213</u>	<u>.193</u>
Milwaukee	**.166**	**.170**	1921-1940	<u>.248</u>	<u>.212</u>
New Orleans	**.087**	**.138**	1941-1960	<u>.289</u>	<u>.237</u>
New York	<u>.199</u>	<u>.185</u>	1961-1980	<u>.307</u>	<u>.254</u>
Philadelphia	<u>.276</u>	<u>.226</u>			
Pittsburgh	**.162**	**.168**	1901-1980	<u>.261</u>	<u>.203</u>
San Francisco	**.163**	**.168**			
St. Louis	**.157**	**.165**			

Note: Boldface indicates that the difference between the within-group and between-group averages is properly signed (i.e., within-group < between-group) and statistically significant at the .01 level. T-stats were calculated using paired samples t-tests. These results do not change when the averages are compared using the non-parametric Wilcoxon signed rank sum test. Unlike the paired samples t-test, the Wilcoxon signed rank sum test does not assume that the differences are interval and normally distributed.

Table 5.3 lists the average within-group and between-group inter-sequence distances for mayors in each of the 15 cities included in this study. Within-group and between-group averages are also provided for all eight historical eras. The first and second columns in Table 5.3 suggest that evidence for distinct career paths in the 15 cities is mixed. In nine cities – Buffalo, Cincinnati, Cleveland, Los Angeles, Milwaukee, New Orleans, Pittsburgh, San Francisco and St. Louis – the average between-group

distance is significantly larger than the average within-group distance. The size of these differences, with the exception of New Orleans, appears to be quite modest. In the other six cities, the average within-group distance exceeds the average between-group distance. In four cases – Cincinnati, Detroit, New York and Philadelphia – this difference is statistically significant at the .01 level. In these cities, the path to the mayor's office is distinguished by its heterogeneity.

The average inter-sequence distances for the eight historical eras in the third and fourth columns of Table 5.3 tell a different story. For each of the 19th century cohorts, the average within-group distance is less than the average between-group distance. These differences are large (compared to the city cohorts) and statistically significant. The relationship, however, is reversed in each of the 20th century cohorts. Here, the average within-group distance exceeds the average between-group distance. These differences are also large and significant at the .01 level. This relationship becomes more apparent when the eight eras are collapsed into 1801-1900 and 1901-1980 periods. In the 19th century, the average within-group distance is smaller than the average between-group difference. The within-group distance for the 20th century, however, is substantially larger than the between-group distance. These figures suggest that a distinct career trajectory existed for mayors during the 19th century – mayors followed similar paths to office. In the 20th century, however, the path to the mayor's office became less predictable – mayors followed quite dissimilar paths to office.

To assess the relative contributions of the city and historical era groupings, both are combined in a single model to explain the inter-sequence distances among pre-mayoral careers. Table 5.4 reports analysis of variance (ANOVA) results and calculates

the share of the total variance explained by both city and era. Interestingly, the city grouping fails to reach statistical significance. In contrast, the effects of historical era are substantial. The era grouping by itself explains approximately 15 percent of the variance. When the average distances are regressed on dummy indicators for each city and era (results not shown), only those for Philadelphia and New Orleans are statistically significant. Seven of the eight historical dummies are significant. Based on these results, it appears that the primary distinctions in the pre-mayoral career are realized across historical eras rather than across cities.

Table 5.4. Results of ANOVA on Pre-Mayoral Career Distances

Source	Partial SS	df	MS	F	Prob > F	% Variance
Model	1.151	21	0.055	7.29	0.000	18.96
City	0.168	14	0.012	1.59	0.077	2.76
Era	0.929	7	0.133	17.64	0.000	15.30
Residual	4.922	654	.008			81.04
Total	6.073	675	.009			

Note: $N = 676$; Adj. R-squared = .164.

What accounts for the distinct career trajectories found for 19th, but not 20th century mayors? While a thorough analysis of this question is beyond the scope here, one explanation comes to mind. Partly in response to social and economic dislocations caused by industrialization and successive waves of immigration (Wiebe 1967), the local state was transformed from a machine-dominated to a reform setting toward the end of

the 19th century. Institutional changes included the creation of independent boards, strong mayors and a local civil service (Banfield & Wilson 1963; Bridges 1997). In big cities across the country, Progressives wrested control of the budget from machine-dominated local councils. Civil service reforms removed a key resource used by machine politicians to reward party loyalists. Executive institutions were strengthened and, with the assistance of nonpartisan elections and the secret ballot, further insulated from party organizations.

These changes are evident in the 15 cities selected for study. In 1899, for example, Baltimore enacted its first new charter since 1796. The new charter expanded mayoral powers. In Boston, mayoral powers were strengthened under a new charter in 1885. In 1895, the term of the mayor was increased from one to two years. In 1910, a reform charter further enhanced mayoral powers and lengthened the term of the office. In Buffalo, the mayor was granted control over the budget in 1902. Chicago passed civil service reform in 1895 and lengthened the mayoral term to four years in 1907. In New Orleans, a new charter adopted in 1896 reduced the size of the city council, set up a civil service system and expanded mayoral appointment powers. The status of New York's mayor was increased when the city was consolidated with Brooklyn, Staten Island, Queens and the Bronx in 1898. In 1905, the mayoral term was lengthened to four years. In San Francisco, a new charter was adopted in 1900 that expanded mayoral prerogatives.

The shift from a political system dominated by local party organizations to one headed by strong mayors with, often, an independent electoral base is consistent with the patterns presented here. In the 19th century, the office of mayor was often overshadowed by city councils that controlled the budget, appointments and other aspects of local

government. Mayors generally served short terms and received small salaries for their efforts. Real authority was often wielded by party bosses or other groups of elites. From this vantage point, the office of mayor was not the prize it has since come to be. Following a series of reform movements toward the end of the 19th century, the mayoralty emerged as an important office with extensive authority for planning and executing public policy. The mayoralty quickly became the primary destination office at the local level.

4. Cluster Analysis of Mayoral Careers

The analysis of city and historical era groupings above suggests the importance of over-time changes in pre-mayoral careers, but leaves much of its variance unexplained. In particular, the sources of between-group and within-group differences in the inter-sequence distances remain obscure. It is unclear whether the city and era groupings represent the best partitioning of the matrix of inter-sequence distances or whether other solutions would be more informative.

The matrix of distances returned by the OM computer algorithm was further analyzed using Ward's hierarchical clustering method (Ward 1963). The procedure begins with each of the 676 mayors in its own cluster or group. Pre-mayoral careers are then successively joined until a single cluster with all 676 mayors is reached. At each joining of one mayor or group of mayors with another, Ward's method attempts to minimize the loss of information that results. Each possible pair of clusters is considered; the procedure selects the cluster that minimizes the error sum of squares defined by the following formula:

$$ESS = \sum_{i=1}^{n}(x_i - x_{mean})^2$$

This error sum of squares criterion distinguishes Ward's method from other agglomerative clustering techniques (Everitt 1993).

The program returned group indicators for all *n* - 1 cluster solutions. The hierarchy of clusters identified by the procedures is depicted by the dendrogram in Figure 5.2. A dendrogram is a tree diagram that illustrates the arrangement of clusters, i.e., the successive joining of observations and clusters. The labels in Figure 5.2 describe the career paths for the two-, three-, four-, five-, six-, and seven-group solutions. In the two-group solution, for example, the 676 mayors are separated into a first category characterized by medium to long pre-mayoral careers and a second category consisting of individuals with little or no political experience. The three-, four-, five-, six- and seven-group solutions reflect ever more fine-grained separations of this first category of mayors.

One drawback of cluster analysis procedures is that they do not identify an optimal number of groups. Indeed, some techniques require the analyst to stipulate a desired number of clusters *a priori*. Scholars have devised several procedures to assist in the selection of the optimal number of groups. These are usually referred to as stopping rules (Milligan & Cooper 1984; Everitt 1993). Ultimately, whether a four-group solution is superior to a three-group solution or a five-group solution is a subjective judgment that the researcher must make. As with the problem of determining the costs of various replacement and indel operations discussed above, there is no substitute for detailed knowledge of the subject matter being investigated.

Figure 5.2. Dendrogram of Pre-Mayoral Careers

In selecting the number of clusters, researchers confront two types of decision error. The first type occurs when a stopping rule produces a solution with more groups than are actually present. The second kind of error occurs when the stopping rule yields fewer clusters than are actually present. Of the two errors, the second is more serious in applied settings. Here, the merging of distinct clusters results in a loss of information. Of the various stopping rules proposed by scholars, the Calinski-Harabasz (1974) pseudo-F index has gained wide acceptance, outperforming many other measures in Monte Carlo studies (Milligan & Cooper 1984). The index is computed by

$$[\text{ trace } B / (k-1)] / [\text{ trace } W / (n-k)]$$

where n is the number of objects, k is the number of clusters, B is the between-cluster sum of squares and W is the within-cluster sum of squares. Larger values of the statistic indicate more distinct clustering.

Calinski-Harabasz pseudo-F statistics were calculated for 11 possible grouping solutions for the 676 pre-mayoral careers. Of these, the two- and three-group solutions register the largest values (165.17 and 165.08, respectively). The two-group solution distinguishes between those with political experience prior to becoming mayor and those without. The three-group solution further divides the former class into a small group of mayors elected following lengthy stints in city administration or on the city council, and a large residual category. These are meaningful distinctions that begin to illuminate the primary differences among the various paths to the mayoralty. Nonetheless, both solutions obscure interesting patterns among those with substantial political experiences before becoming mayor. A more detailed grouping solution is needed to fully describe the salient differences among pre-mayoral careers.

Table 5.5. Description of Pre-Mayoral Clusters

Cluster	N	% Exit	Description	Sample Career
Journeyman	148	52.03	Medium, National, State + Local Mix	RRRKKKKM
Local Apprentice	101	46.53	Medium, Local Mix	BBBBM
Political Amateur	331	56.80	Little or No Experience	M
Federal-State Interloper	57	71.93	Long, National, State Legislature	RRRRRRRRRRM
City Bureaucrat	18	66.67	Long, Local Administration	QQQQQQQQQQQQQQQQQM
Council Vet	21	52.38	Long, Local Legislature	BBBBBBBBBBBBBBM

Note: B = Local Legislature; K = Local Law Enforcement; M = Mayor; R = State Legislature; Q = Local Administration

In examining the remaining solutions, a six-group solution appeared to best fit the data. This solution also has the largest pseudo-F statistic (126.20) among the remaining groupings. The six clusters are described in Table 5.5. The largest cluster, accounting for approximately half of the 676 mayors in the sample, has been labeled "Political Amateur." Mayors in this category assume the office with little or no previous political experience. The next largest category, "Journeyman," includes individuals who occupied a mix of federal, state and local offices prior to becoming mayor. A third category, labeled "Local Apprentice," consists of those who spent most of the pre-mayoral career in local offices. The remaining three categories are smaller and distinguished primarily by the length and type of pre-mayoral offices. The "Federal-State Interloper" category identifies mayors that occupied mostly state and national offices before winning the

mayor's office. The "City Bureaucrat" and "Council Vet" categories are small groups of mayors that had long stints in local administrative and legislative office.

Table 5.6. Features of Pre-Mayoral Career Clusters

Cluster	# Levels	# Functions	# Offices	Yrs. Public Service	% Local Experience
Journeyman	1.58	1.64	2.86	11.89	82.43
Local Apprentice	1.30	1.53	2.29	9.70	100.00
Political Amateur	0.70	0.72	0.96	1.58	44.11
Federal-State Interloper	1.82	1.56	2.98	14.37	50.88
City Bureaucrat	1.33	1.61	3.89	25.78	100.00
Council Vet	1.33	1.52	2.24	22.95	100.00

Note: Cell entries represent cluster averages except for those in median start year. Cell entries in "Median Start Year" denote median year began mayoral office.

Table 5.6 describes the salient features of these career paths, including the average number of public offices, levels of government and political functions in the pre-mayoral career. Political Amateurs have by far the least political experience. These officeholders accumulated less than two years of public service on average, with less than half holding local office prior to becoming mayor. In contrast, the average length of the pre-mayoral career among City Bureaucrats and Council Vets exceeds 20 years. Every member of these two clusters held a local office before becoming mayor. The low average number of levels of government (1.33) indicates that most of the pre-mayoral career was spent at the local level. The Local Apprentice category looks like an

abbreviated version of these latter two categories, distinguished primarily by the shorter length of the pre-mayoral career.

The Journeyman and Federal-State Interloper clusters exhibit the most complex pre-mayoral careers. In both categories, individuals spent more than 10 years in public service on average before becoming mayor. The high averages for levels of government and functions indicate that members of these two categories were seasoned political professionals. The frequency with which these politicians transitioned between very different offices suggests an ability to adapt to a variety of electoral circumstances and job-related demands. Only half of those in the Federal-State Interlopers cluster held local office before capturing the mayoralty. Nonetheless, these mayors served in some of the more challenging local political settings.

Table 5.7 examines the distribution of the six clusters across time, using the eight historical eras defined in Table 5.1. The most striking pattern that emerges is the gradual disappearance of Political Amateurs. In the early 19th century, more than two-thirds of those who became mayors in these 15 cities were amateurs. Professionalization of the pre-mayoral career began in earnest following Reconstruction. By the start of World War II, Political Amateurs constitute less than one-fifth of big-city mayors. In contrast, lengthy pre-mayoral careers like those in the City Bureaucrat and Council Vet categories were unheard of in the 19th century. By 1980, however, these two groups accounted for 20 percent of mayors in these cities.

Table 5.7. Distribution of Pre-Mayoral Career Clusters Across Time

	Historical Era							
Cluster	1801-1840	1841-1860	1861-1880	1881-1900	1901-1920	1921-1940	1941-1960	1961-1980
Journeyman	14.86	16.23	15.20	23.00	37.84	31.58	36.96	15.22
Local Apprentice	9.46	12.34	13.60	17.00	14.86	10.53	19.57	32.61
Political Amateur	67.57	65.58	62.40	48.00	31.08	35.09	17.39	6.52
Fed.-State Interloper	8.11	4.55	4.80	6.00	12.16	8.77	13.04	26.09
City Bureaucrat		1.30		2.00	4.05	8.77	2.17	10.87
Council Vet			4.00	4.00		5.26	10.87	8.70

In the 20th century, amateurs have been replaced by professional politicians capable of adapting to exigent local circumstances. Journeymen and Federal-State Interlopers account for more than 40 percent of big city mayors between 1940 and 1980. The share of Local Apprentices also increased, from less than 10 percent between 1801 and 1840, to about one-fifth in the 1941-1960 and nearly one-third in the 1961-1980 eras. Compared to the 19th century, the modern pre-mayoral career features remarkable heterogeneity. The number of viable paths to the office has increased. The even distribution of pre-mayoral careers over the six categories in later eras is consistent with the differences in inter-sequence distances presented above. In later periods, the resumes of those reaching the mayor's office were remarkably heterogeneous.

The disappearance of the Political Amateur and emergence of professionals following multiple paths to the mayoralty appears to reflect a variety of factors. Table

5.8 considers a few of these, including changes in individual characteristics and local institutional settings. The typical Political Amateur was an individual with little formal education and a background in business. Most amateurs served in cities of modest size where the length of the mayoral term was one or two years. The City Bureaucrat and Federal-State Interloper categories offer a much different profile. These individuals tended to be older, highly educated and drawn from non-business professions. They served in the largest cities (more than 1 million people) where the length of the mayoral term exceeded two years.

Table 5.8. Explaining Pre-Mayoral Career Clusters

Cluster	Median Start Year	City Population	Term Length	Age	% Some College	% Business Experience
Journeyman	1898	751,733	2.39	47.38	56.08	25.68
Local Apprentice	1886	641,217	2.29	45.41	42.57	47.52
Political Amateur	1863	390,165	1.90	45.03	30.82	45.62
Fed.-State Interloper	1906	1,207,823	2.63	50.23	75.44	24.56
City Bureaucrat	1922	1,740,905	3.06	53.06	55.56	38.89
Council Vet	1933	684,077	3.00	57.38	33.33	28.57

These differences are consistent with past work on mayoral careers. Dahl (1961) observed that cities in the mid-19th century were dominated by local business elites ("patricians"). With changes in the structure of the national economy, these elites were successively replaced by men drawn from industry ("entrepreneurs") and, eventually, the

machine politician. The post-war city has seen the emergence of powerful mayors with an independent base of support ("executive-centered coalitions"). Several changes have occurred to make this transition from patrician to executive-centered coalition a reality. First, Progressive Era reforms strengthened the office by awarding mayors greater appointment powers and longer terms. Second, cities grew in size, bringing greater prestige to and increasing demands on the mayoralty (Dahl 1961; Salisbury 1969). The personal profile of the mayor has changed to fit these new circumstances. 20th century mayors are more highly educated than 19th century mayors and drawn from professions (e.g., law) that facilitate lengthy political careers.

Table 5.9. Consequences of Pre-Mayoral Career Clusters

Cluster	Years as Mayor	% Defeated	% Retired	% Sought Other	# Subsequent Offices
Journeyman	4.62	25.00	61.49	4.05	0.93
Local Apprentice	4.66	13.86	77.23	0.99	0.92
Political Amateur	3.72	16.31	72.81	3.63	0.67
Federal-State Interloper	6.82	22.81	61.40	0.00	0.46
City Bureaucrat	7.22	44.44	44.44	5.56	0.50
Council Vet	6.05	19.05	80.95	0.00	0.71

Did any of these changes make a difference, i.e., in mayoral behavior? Table 5.9 compares the length of tenure, manner of exit and post-mayoral experiences across the

six categories. Those in the Political Amateurs cluster, not surprisingly, spent the least

amount of time in the mayor's office. Mayors in the last three categories spent the most

time in the office. Measures of mayoral performance are difficult to come by, but the

figures on manner of exit are suggestive. Those in the City Bureaucrat cluster were more

likely to be defeated than members of the Federal-State Interloper and Council Vet

clusters. Perhaps the electoral experiences of the latter enabled them to better navigate

local political settings. Finally, the Journeyman and Local Apprentice clusters exhibit the

highest amount of post-mayoral activity. For these incumbents, the mayoralty appears to

represent a step toward other offices rather than a destination in its own right. These

preliminary inferences are explored in greater detail in Chapter 6.

5. Multi-nomial Logit Analysis of the Pre-Mayoral Career

To determine what factors, if any, systematically influence how individuals reach

the office of mayor, I included measures of individual characteristics and the local

institutional setting in a statistical model of the pre-mayoral career. The dependent

variable in the model is a measure of previous political experience based on the pre-

mayoral career paths described above. To simplify the presentation, I collapsed the six

pre-mayoral career paths into three categories. I grouped the Political Amateur and Local

Apprentice paths into a single category, indicated by the dummy AMATEUR. Similarly,

the City Bureaucrat and Council Vet paths are grouped together and denoted by LOCAL

CAREERIST. The two remaining career paths, Journeyman and Federal-State Interloper

(both highly professionalized paths) form an omitted PROFESSIONAL category in the analyses that follow.[30]

The model includes several measures of personal attributes. The variable EDUCATION indicates the highest level of education achieved by the individual. The variable ranges from 1 to 4, with 1 indicating less than high school, 2 a high school diploma, 3 some college and 4 at least a college degree. Two dummy variables describe the type of occupation an individual practiced prior to entering politics. BUSINESSMAN takes the value 1 if the individual held a position in business. LAWYER takes the value 1 if the individual worked in a law firm or was in private practice. Finally, I include a dummy variable, DEMOCRAT, to see whether differences in party affiliation led to different pre-mayoral experiences. Many of the cities analyzed here had entrenched Democratic party organizations for much of the period of study. I expect that, all else equal, Democratic mayors were more likely to emerge from the non-amateur categories, as individuals had to work their way up through the party ranks.

Past work on political careers finds that institutional settings, including electoral system institutions, exert powerful effects on behavior in office. Less understood is how political institutions shape the career paths to various offices. In addition to influencing behavior in office, institutions can indirectly shape the political career by making certain career paths more likely. One such indirect effect is actuarial in nature. Individuals seeking entry to an appointed office have to wait until a vacancy occurs. Those seeking an elected office must wait until the next scheduled contest. The wait time for an office

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[30] The substantive results reported below do not change much when dummy variables for five of the six clusters are used in lieu of the three-group model described here.

with a four-year term is twice as long as for an office with a two-year term. The more powerful indirect effects, however, are realized via selection. Certain institutions can enhance or diminish the value of an office. Institutions that reduce the threat of electoral defeat or increase the prerogatives of incumbents add value to an office. These offices are more likely to attract qualified candidates, including those with substantial political resumes.

The pre-mayoral career path model includes three variables describing the local institutional setting. The first, COUNCIL MANAGER, takes the value 1 if the individual became mayor in a city using the council-manager form of government. In council-manager cities, the mayor does not control the budget or city personnel. The mayor presides over the city council, but the powers of the office are more ceremonial than formal. I expect that mayors in these cities will be more likely to follow the amateur than professional career path. In some of the council-manager settings included here, mayors were elected indirectly by the city council. Thus, I also expect that mayors in these cities will also be more likely to emerge from the local careerist category.

The second variable, TERM LENGTH, indicates the length of the mayoral term. In cities where the length of the mayoral term is three or four years, the prestige and powers of the office tend to be high. Mayors also have to face reelection less frequently. Thus, I expect a negative relationship between term length and the amateur career path. I expect a positive relationship between term length and the local careerist path. The third variable, TERM LIMIT, takes the value 1 if a term limit was in place. The effect of term limits on the pre-mayoral career is not as clear cut. While term limits can diminish the value of an office, they are often adopted in cities where the mayor is the most powerful

figure in local politics. Since the second consideration was probably more important, I expect a negative relationship between term limits and the amateur category and a positive relationship with the local careerist category.

The model also includes a control for city size. POPULATION indicates the approximate size of the city's population (divided by 10,000 for purposes of scale), based on decennial census data, during the first year of the individual's stint in the mayor's office. The effect of city size works much like the local political institutions described above. In large cities, both the prestige of and demands on the mayoralty tend to be high. Thus, I expect a negative relationship between city size and the amateur career path. I expect to find a mild positive relationship between city size and the local careerist category.

5.1 Results

Table 5.10 contains the results of a multi-nomial logit model of the pre-mayoral career. The dependent variable is a trichotomous indicator of whether the individual followed the amateur, local careerist or professional path to the mayoralty. The professional category, consisting of the Journeyman and Federal-State Interloper categories described above, forms the omitted category.[31] The coefficients indicate the log odds of following the amateur versus the professional career path. Table 5.11 converts the coefficients in Table 5.10 into first differences (King, Tomz & Wittenberg 2000; Tomz, Wittenberg & King 2003). The results mostly conform to the expectations

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[31] The multinomial logit estimator assumes independence of irrelevant alternatives (IIA). All of the competing risks models reported below passed the specification tests proposed by Hausman & McFadden (1984).

stated above. Both individual characteristics and the local institutional setting help

predict the path individuals follow to the mayor's office.

Table 5.10. Model of Pre-Mayoral Career Paths

	Amateur	Local Careerist
Council Manager	.794	1.566
	(1.40)	(1.32)
Term Length	-.092	.390**
	(0.99)	(2.37)
Term Limit	-.437	.830*
	(1.50)	(1.82)
Population	-.003**	.001
	(2.31)	(0.95)
Education	-.297***	-.268*
	(3.45)	(1.62)
Businessman	.533**	-.194
	(2.45)	(0.48)
Lawyer	-.379	-1.873***
	(1.57)	(2.82)
Democrat	-.551***	-.085
	(2.96)	(0.22)
Constant	1.930***	-1.945***
	(6.88)	(3.31)
Log-Likelihood		-484.149
N		673

NOTE: Numbers are multinomial logit coefficients with t-stats in parentheses.
* p < .10, ** p < .05, *** p < .01

The coefficients in Table 5.10 are difficult to interpret directly, especially as most

of the variables in the model are dummy variables, i.e., the averages have no empirical

referents. Table 5.11 shows the effects of each variable on the probability of following

the amateur or local careerist paths with other variables set at their median values. Interestingly, differences in local institutional settings register the largest effects in the model. Increasing the length of the mayoral term from two to four years reduces the probability that mayors will follow the amateur path by .08. The same change increases the probability of the local careerist path by .09. The impacts of term limits are even larger. In cities that imposed limits on how long a mayoral incumbent can serve, individuals are 15 percent less likely to emerge from the amateur path and nine percent more likely to follow a local careerist path. These findings constitute powerful evidence of the indirect effects of political institutions on the paths to public offices.

The results in Table 5.11 also show the influence of individual characteristics, party affiliation and city size. Businessmen are more likely to follow the amateur path and less likely to become local careerists. Lawyers are also less likely to follow the local careerist path. Presumably, these findings reflect the fact that success in business or law reduces the likelihood that individuals will give up their private jobs for lengthy stints in lower local offices. Individuals with some college training are less likely to be amateurs. So are Democrats, corroborating the expectation stated above. Finally, increasing city size reduces the probability of that mayors will follow the amateur path by .03. The same change increases the probability of the local careerist path by .01.

Table 5.11. Changes in the Probability of Pre-Mayoral Career Paths

			AMATEUR			LOCAL CAREERIST		
Changing this variable ...	*from ...*	*to ...*	*changes the prob. of... by*	*Lower bound*	*Upper bound*	*changes the prob. of ... by*	*Lower bound*	*Upper bound*
Council Manager	0	1	-.01	-.33	.17	.10	-.04	.47
Term Length	2	4	**-.08**	-.16	-.01	**.07**	.02	.15
Term Limit	No	Yes	**-.15**	-.27	-.03	**.09**	.02	.23
Population[a]	60,812	583,899	**-.03**	-.05	-.01	**.01**	.00	.02
Education	High School	Some College	**-.06**	-.11	-.02	-.00	-.01	.02
Businessman	No	Yes	**.09**	.02	.15	-.02	-.06	.00
Lawyer	No	Yes	-.04	-.13	.05	**-.04**	-.07	-.01
Democrat	No	Yes	**-.11**	-.18	-.04	.02	-.02	.07

NOTE: The probabilities depicted here are generated from Table 5.10. The baseline probability of being in the omitted category (Journeyman, Federal-State Interloper), i.e., when all variables are set to their medians is .19. The baseline probability of being in the Amateur category (Political Amateur, Local Apprentice) is .76. The baseline probability of being in the Professional category (Council Vet, City Bureaucrat) is .05. Boldface indicates differences are significant at the .05 level. Upper and lower bounds denote boundaries of the critical interval for each estimate.
[a] These values correspond to the 25th and 75th percentiles.

6. Conclusion

The sequence analysis techniques described in this paper represent a set of tools for uncovering difficult-to-discern patterns in datasets where the unit of analysis is an ordered array or sequence of events rather than an individual event or choice. Past scholarship has generally modeled the political career as a collection of isolated events or

choices generated by a stochastic process. For standard statistical techniques, this independence assumption is necessary. Nonetheless, it ignores potentially important information about the sequence of events. Sequence analysis methods require no assumptions about the data generating process. However, the analyst must make important judgments in deciding how to weight various replacement and indel operations, and in determining the number of clusters to focus on.

The sequence analysis methods described here allowed me to address two important questions raised by past research on political careers – whether there are distinct paths to certain public offices and, if so, what factors determine the career paths that individuals follow. Using optimal matching and cluster analysis, I was able to partition the pre-mayoral career into a small number of discrete paths. The relative frequency of these paths has changed substantially over the course of history, primarily driven by the disappearance of amateurs during the 20th century. Using this novel measure of political experience, I showed that pre-mayoral career paths can be explained with reference to both individual characteristics and local institutions. The latter are particularly impressive and demonstrate that institutions affect more than the behaviors of incumbents. They are instrumental in shaping careers across the political system.

Sequence analysis methods can be readily extended to other political careers. The 676 mayors analyzed in this paper are just a small subset of public officials in the U.S. federal system. These methods can also facilitate comparison of career trends across countries and over time. In Chapter 4, I examine differences among career sequences for other officeholders, including members of the U.S. cabinet, House, Senate, federal judiciary and those serving as governors in the 50 states. Studying the careers of those

occupying these very different offices will help further illuminate the impact of national political trends, appointment procedures, electoral system institutions, and internal organization on political ambition. In doing so, I hope to make more concrete the presumed link between how individual politicians reach public office, and political behavior and political institutions.

Political careers represent just one of many phenomena of interest to political scientists that involve sequences of events or choices. Past scholars, for instance, have focused on the path that nations take to modernization (Rostow 1960; Inglehart & Welzel 2005). Economic change, political development (Huntington 1968), revolution (Skocpol 1979) and the rise of nationalism (Deutsch 1961) are all outcomes that scholars have modeled as historical sequences. Contemporary public policy processes, including lawmaking and budgetary processes (Padgett 1980), can be modeled as decision-making sequences. In international relations, researchers have focused on the sequence of events that lead to ethnic conflict and war. Finally, political scientists have offered a variety of cyclical theories to explain critical elections (see Mayhew 2000), presidential leadership (Skowronek 1993) and the resurgence of racism (Woodward 1966). Given the importance of these subjects, the potential contribution that sequence analysis methods can make is substantial.

Chapter 6

Careerism in Your Neighborhood:
The Effects of Political Experience on Mayoral Reelection and Retirement

In *Federalist* 10, Madison argued that the implementation of free elections in a large republic would result in the selection of those who possess "the most attractive merit" and "most diffusive and established characters" for public office (Rossiter 1961). What constitutes the most attractive merit lies at the heart of theoretical and empirical studies of representation (Pitkin 1972). Madison fervently believed that the selection of a fit choice – more likely in large republics where the proportion of representatives to citizens is low – would improve political decision-making. Thus, both personal background and experience matter. Much past research by political scientists has proceeded under a similar assertion – that knowledge about who serves in public office and how they got there will inform studies of political behavior and political institutions. But as Matthews (1983) stated in a review of several decades of research on democratic legislatures, the link between how individuals get to office and what they do while there is more often asserted than demonstrated.

Nowhere is the gap between theoretical expectation and empirical reality more evident than in research on previous political experience and political careerism. Whereas recent scholarship has observed a steady rise in careerism, especially among those serving in Congress (Polsby 1968) and state legislatures (Moncrief 1999), this trend has not been linked to changes in the attributes of those running for and winning public office. Indeed, the most detailed study of the backgrounds of those elected to the U.S.

House concluded that previous experience has not changed much (Bogue et al. 1976). Similarly, recent empirical studies of career decision-making typically fail to account for previous experience. Thus, perhaps the most important change in the behavior of those who serve in public office appears to be unrelated to how they got there.

One potential explanation for this disconnect is the difficulty in measuring previous political experience. Whereas, information about how politicians reach a particular office is encoded in complex sequences of office-holding events, most measures of experience are comparatively crude. Some studies use binary indicators of whether a candidate has held a particular office or any elective office at all. Others count the number of years an incumbent has occupied the current office, ignoring other office-holding experiences. Differences among officeholders in the number, type and order of offices held are potentially limitless. For those interested in establishing a link between the path to office and political behavior, figuring out which differences to focus on is a difficult problem.

In recent years, statistical techniques have been developed that facilitate the analysis of complex sequences of events. In this paper, I demonstrate the usefulness of sequence analysis techniques (Abbott 1995; Macindoe & Abbott 2004) for making sense of office-holding sequences. Specifically, I apply an optimal matching algorithm to newly collected data on mayoral careers in 15 large U.S. cities from 1820 to 1980.[32] This algorithm produces a matrix of distances that capture differences among mayors in the

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[32] Focusing on mayors has several advantages. First, there are far fewer big city mayors than governors, senators or representatives. Second, the office has changed substantially over time. So has the background and experiences of those reaching the mayoralty (Dahl 1961). Third, compared to other offices in the U.S. federal system, mayors have received little attention. To my knowledge, this is the first systematic study of mayoral tenure that incorporates previous political experience and election returns.

number, type and order of offices they occupied prior to becoming mayor. These distances are then analyzed using cluster analysis to identify meaningful groupings, i.e., paths to office, in the data. Substantively, I show that the pre-mayoral career can be partitioned into a few, recognizable career paths. Finally, I show that differences in previous experience can help explain behavior in office, in particular mayoral reelection and retirement.

This paper proceeds as follows. The next section briefly reviews past work on political careers, pointing out the difficulties in measuring previous experience. The third section describes how career sequences for mayors were collected and coded. I then introduce sequence analysis techniques and the optimal matching (OM) algorithm used to distinguish differences in sequences of events. The fourth section describes the cluster analysis procedures used to partition the distances returned by the OM algorithm into meaningful groups, or career paths. The fifth section conducts an event history analysis of mayoral tenure, showing that career paths predict mayoral reelection and retirement. In doing so, I also compare this measure of previous experience against alternatives. The final section concludes with a discussion of the potential that sequence analysis methods have for career studies and other sequential data of interest to political scientists.

1. Existing Research on Political Careers

The attention paid to the career choices of public officials reflects the importance of public-sector mobility for core concerns like freedom and representation. Democratic governments rely on individual, self-interested politicians to organize the competition for power, articulate preferences for alternative courses of action, and spur institutional

change when the needs of the governed are not being met by government (Fowler 1993).

Political scientists have identified several factors that give shape to political ambition.

Jacobson & Kernell (1981), for example, observed that national trends, such as economic

performance (Nadeau & Lewis-Beck 2001) and short-term events or scandals

(Groseclose & Krehbiel 1994; Jones 1994), influence both candidate entry and

fundraising success. Others have related aspects of the electoral system, including the

secret ballot (Katz and Sala 1996), direct primary (Engstrom & Kernell 2005) and

redistricting (Cox and Katz 2002; Carson, Engstrom & Roberts 2006) to individual

decisions to retire and seek another office. Legislative scholars have found that internal

organization, including party leadership and committee systems, impact career trends

(Polsby 1968; Polsby, Gallaher & Rundquist 1969; Squire 1988, 1992). Finally, there is

ample evidence that the structure of opportunities in regions and states shapes the ability

of politicians to transition between offices (Schlesinger 1966; Rohde 1979).

These works demonstrate that studying political careers can clarify the effects of

national trends, electoral system institutions, internal organization and opportunity

structures. Interestingly, these insights are based mostly on empirical analyses that treat

individual career decisions as independent choices generated by a stochastic process

(Kiewiet & Zeng 1993). There is almost no consideration of previous choices or

experiences. When previous experience is included in models of career decision-making,

it is usually measured with crude indicators, e.g., whether a candidate has held elective

office (Jacobson 1989) or years spent in the current office (Kernell 2003). With few

exceptions (Schlesinger 1966),[33] there has been little consideration of career sequences – the string of office-holding events that comprise a political career. As a result, we lack basic information about whether there are patterns among career sequences, what factors give rise to these patterns, and what consequences, if any, they have.

Given these limitations, the insights contributed by past work on political careers are impressive. They suggest that by improving existing measures of previous experience and expanding the scope of empirical analysis to include career sequences, existing knowledge on a range of phenomena can be improved. Until recently, empirical analysis of career sequences has been inhibited by the absence of detailed information on the number, type and order of offices held by public officials. The most comprehensive dataset on the careers of members of the U.S. Congress (McKibbin 1997), for example, provides information on offices previously held, but not their order or the length of time spent in each. In collapsing career sequences into a series of binary indicators, we lose information that could potentially explain how politicians behave in office and what they do afterward.

Efforts to study career sequences have also been hampered by shortcomings in the traditional statistical methods used to study political careers. These methods (e.g., regression, time series and event history analyses) require the analyst to model decisions made over the course of a career as a series of independent events produced step-by-step by a data generating process. In recent years, however, advanced methods for studying patterns in sequences have become available for use by social scientists. In particular,

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[33] Schlesinger compiled extensive data on the office-holding experiences of gubernatorial and Senate candidates between 1900 and 1956. He mapped out the various paths these candidates took to high office and related differences in experience to features of state settings.

sequence analysis methods developed by molecular biologists studying DNA sequences are now being used to study a range of sequential phenomena of interest to political scientists, economists, and sociologists. These methods enable the analyst to uncover patterns in complex sequences of events and, as such, are ideally suited for examining patterns among political careers.

2. Sequence Methods

Sequence analysis refers to a body of methods that take whole sequences of events as units of analysis, rather than treating each event as an individual data point. In this way, sequence analysis differs from time series methods, which treat a series of events as generated step-by-step via a stochastic process. Stepwise approaches, such as first-order Markov processes and event history analysis, have been the standard methods applied to sequential data in the social sciences (see Abbott 1995). These methods, however, require assumptions about the relationship between adjacent events, and usually ignore information about the ordering of events. Sequence analysis methods can be applied to any ordered listing of events and have been used to study careers (i.e., sequences of jobs), lifecycles (sequence of life events, e.g., education, work, retirement) and social phenomena (e.g., sequences of elements in dance performances).

Sequence analysis proceeds in four steps. In the first step, data describing sequences of events, in this case a series of office-holding events, are coded and formatted for analysis. In the second step, an optimal matching (OM) algorithm is used to calculate a distance measure between sequences of events – in this case, pre-mayoral careers. In the third step, exploratory techniques, such as cluster analysis and multi-

dimensional scaling, are used to group similar sequences together, in this case similarities among the paths followed to the mayoralty. Finally, these groupings of sequences are used as independent or dependent variables in statistical analysis. Here, I use the pre-mayoral career path to predict mayoral reelection and tenure in office. This rest of this section briefly describes the first two steps: data coding and formatting, and the application of the OM algorithm to pre-mayoral career sequences.

2.1 Data and Coding

The data used in this study consist of complete career sequences and other information for 676 mayors listed in the *Biographical Dictionary of American Mayors, 1820-1980* (Holli and d'A. Jones 1980). The *Dictionary* describes the background, employment history, electoral experiences and public accomplishments of every individual holding the office of mayor in 15 leading American cities between 1820 and 1980. Entries for some mayors are more extensive than others, reflecting the difficulty of compiling information on mayors who occupied the office for a short time and left little historical imprint on the cities they governed. Nonetheless, these entries, written by more than 100 scholars working with local archival materials and secondary sources, constitute the most complete source of data on mayoral careers.

The 15 cities are Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Detroit, Los Angeles, Milwaukee, New Orleans, New York, Philadelphia, Pittsburgh, San Francisco and St. Louis. They are not a random sample of all cities, or even large U.S. cities. In selecting their cases, the editors opted for those cities "that have maintained consistent leadership in population and historical importance since the 1820s." The

sample includes more Northeast and Midwest cities than West Coast and Sunbelt cities.
Several of the fastest growing cities over the past 30 years, such as Dallas, Houston,
Phoenix and San Diego, were not included. Many of these southwestern cities utilize the
council-manager plan, under which the mayor is a ceremonial post with little control over
the budget and everyday operations. Of the 15 cities included here, only Cincinnati used
the council-manager plan for any significant amount of time.[34]

The procedures used for assembling the sequence of public offices held by each
mayor and calculating the distances between them encompassed three steps. In Step 1,
biographical information was transferred from the *Dictionary* to a database file.[35] Each
public-sector job that an individual mayor held was entered in the order it was occupied.
Start and end dates for each office were recorded along with information about the age,
education, non-public occupations, political party affiliation and electoral experiences of
each mayor.

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[34] The 676 mayoral careers are spread relatively evenly across cities, with some variation due to the later
founding of cities like Los Angeles and San Francisco. The distribution of mayoral careers across
historical eras is uneven, with more mayors serving prior to 1900. This unevenness reflects changes in the
length of the mayoral term, the preferences of voters, and differences in the career objectives of mayoral
incumbents. Each of these cities grew substantially in size, in some cases from less than 10,000 to well
over one million, over the period of study. In a majority of the 15 cities, the length of the mayoral term
increased from one to four years.

[35] Database programs like FileMaker Pro allow coders to design interfaces that use check-boxes, radio
buttons, pull-down menus and authentication routines. These tools help minimize typing and other coding
errors. Most of the information in the dataset was entered by the author with the assistance of several
undergraduate students.

Table 6.1. Classification of Public Sector Jobs

Level	Function			
	ADMINISTRATIVE	EXECUTIVE	JUDICIAL	LEGISLATIVE
FEDERAL	Administrator (F) (*Counsel, FTC*)	President (X)	Federal Judge (J) (*Associate Justice, U.S. Court of Appeals*)	Representative (H)
	Law Enforcement (L) (*U.S. Attorney*)	Cabinet Officer (C) (*U.S. Attorney General*)		Senator (S)
	Diplomat (D) (*Minister to Italy*)			
STATE	Administrator (A) (*Director, State Equalization Board*)	Governor (G)	State Judge (W) (*Chief Justice, Supreme Court of Ohio*)	State Legislature (R)
	Law Enforcement (U) (*District Attorney*)	State Executive (E) (*Secretary of State*)		
LOCAL	Administrator (Q) (*Director, Parks Department*)	Mayor (M)	Local Judge (V) (*Probate Judge*)	City Council (B)
	Law Enforcement (K) (*Police Officer*)	Local Executive (T) (*Deputy Mayor*)		

Note: Letters in parentheses are letter codes used to denote different job types. Positions in italics are examples of the various job types.

In Step 2, public-sector jobs were further assigned one of 20 values from a typology of local, state and federal offices. Table 6.1 reproduces the typology of offices used here. Each office type was given a letter code to distinguish it from other types. Federal law enforcement offices were all assigned the letter "L." Service in the state legislature is denoted by the letter "R." In Step 3, the sequence of public offices for each mayor was constructed by assembling an "office-year string" for every office in the public career. Each string consists of a letter code for the office repeated once for each year the office was occupied. If a mayor served in the state legislature for four years, then the string "RRRR" would be added to the sequence. For each mayor, the office-year strings were then concatenated in the order of offices occupied to form a final career sequence.

Figure 6.1 shows complete sequences for two mayors in the dataset, George Cryer and William Green, III. The career sequence for George Cryer combines four office-year strings. Cryer began his political career in 1910 with a two-year stint as Assistant U.S. Attorney ("LL"). He then worked for two years in the Los Angeles City Attorney's office ("KK") and for four years as Chief Deputy Los Angeles County District Attorney ("UUUU"). Cryer became Mayor of Los Angeles in 1921, was reelected in 1923 and 1925, and served eight years ("MMMMMMMM"). He did not run for reelection in 1929, but campaigned for his old job in 1933. After being defeated in the primary, Cryer retired to private practice. Green began his career by winning a special election to the U.S. House to fill a vacancy caused by the death of his father. He was reelected six times, serving a total of 13 years ("HHHHHHHHHHHHH"). He left the House for an unsuccessful bid for the U.S. Senate in 1976. Green was elected Mayor of Philadelphia

in 1979 and held the office for a single four-year term ("MMMM"). He spent most of his term closing a gaping budget deficit left by his predecessor and declined to seek reelection. After his mayoral tenure, Green worked for a prominent Washington lobbying firm.

William Green, III, Philadelphia

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 H   H   H   H   H   H   H   H   H   H   H   H   H   M   M   M   M
 L   L   K   K   U   U   U   U   ∅   M   M   M   M   M   M   M   M
```
George Cryer, Los Angeles

H = House; K = Local Law Enforcement; L = Federal Law Enforcement; M = Mayor;
U = State Law Enforcement

Step 1: Replace element L with H
Step 2: Replace element L with H
Step 3: Replace K with H
Step 4: Replace K with H
Step 5: Replace U with H
Step 6: Replace U with H
Step 7: Replace U with H
Step 8: Replace U with H
Step 9: Insert H
Step 10: Replace M with H
Step 11: Replace M with H
Step 12: Replace M with H
Step 13: Replace M with H

Figure 6.1. Alignment of Career Sequences for Two Big-City Mayors

2.2 Optimal Matching

The problem of measuring differences (i.e., distances) between sequences is solved by a dynamic programming technique called optimal matching. In the version of optimal matching used here, two elementary operations are used to transform one sequence into another. The sequences consist of strings of well-defined elements that can, but need not repeat. The first operation, *replacement*, involves replacing one element with another element. For example, with a simple replacement of the letter "O" for the letter "E," the sequence "PSYCHE" is transformed into "PSYCHO." The second operation, *insertion-deletion*, involves inserting or deleting an element from a sequence. Deleting the letter "G" from "GLOVE" transforms this sequence into "LOVE." Conversely, "LOVE" can be transformed into "GLOVE" with the insertion of the letter "G." Insertion and deletion are equivalent operations and are collectively called *indel*.

The distance (or difference) between two sequences is a function of the number of these elementary operations. Two sequences that require a large number of replacements and indels to transform one into the other are said to be further apart (i.e., more different) than two sequences that require a small number of operations. For complex sequences, there is typically more than one way to effect a transformation. The minimum distance, defined in terms of the number of elementary operations needed to transform one sequence into another, is referred to as the edit or Levenshtein distance (Levenshtein 1966).

Figure 6.1 provides a solution for transforming the Cryer sequence into the Green sequence. The first two operations involve replacing element "L" (federal law enforcement) with element "H" (House); the next two replace element "K" (local law

enforcement) with "H." In steps 5 through 8, element "U" (state law enforcement) is replaced with "H." Then, an insertion of "H" is made followed by four replacements of element "M" (mayor) with "H." One question that must be answered in calculating a pairwise distance for these two careers is whether the costs of these different replacement operations will be equal. Should the transition between a federal law enforcement position and the House, for example, be weighted the same as the transition between mayor and the House? Another question that must be answered is whether these replacement costs will be the same as or different from the cost of adding an additional year of House service to the Cryer sequence? The answers to these two questions give shape to sequence comparison.

The OM procedure uses the Needleman-Wunsch algorithm (Needleman & Wunsch 1970) to find the least cost solution given the weights assigned by the analyst to various replacement and indel operations. In Figure 6.1, for example, suppose all replacement and indel operations were assigned a cost of 1. Then the least cost solution of transforming the Cryer sequence into the Green sequence would involve 13 steps, for a total cost of 13. The OM algorithm does allow the analyst to distinguish among replacement operations and assess different costs for replacements and indels. Since any replacement can be achieved via one deletion and one insertion, setting the cost of indels at less than half of the cost of replacements ensures that the algorithm will use only indels in making a transformation. The various costs of replacements and indels are assembled in a matrix of substitution costs.

2.3. *Optimal Matching with Substitution Costs*

Specifying substitutions costs is the central theoretical exercise in sequence analysis (Brzinsky-Fay, Kohler & Luniak 2006). In setting costs, the analyst must rely on substantive knowledge of the subject matter. While the absolute magnitude of the costs does not matter, the relative costs of replacement and indel operations give structure to sequence comparison. The OM algorithm is an exploratory tool. Used properly, it can illustrate patterns in sequence data that are difficult to find through traditional methods. Like all statistical methods in the social sciences, however, the tools of sequence analysis are no substitute for detailed knowledge of the phenomena being studied (Macindoe & Abbott 2004).[36]

Past studies of political careers (Schlesinger 1966; Bogue et al. 1976) differentiate public offices by level of government (e.g., local, state, and federal) and the tasks or functions that an incumbent performs (e.g., administrative, executive, judicial, and legislative). I adopt these two primary distinctions in setting substitution costs here. In particular, I first assume that any two offices with identical job types can be substituted for each other at no cost. However, any substitution of one job type with another incurs a basic penalty of 1. Thus, any two local administrative jobs are substitutable at no cost; but substituting a local administrative with a local law enforcement job entails a cost of 1.

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[36] In contrast to the theoretical approach used here to assign substitution costs, some scholars refuse to distinguish among possible substitutions (Dijkstra & Taris 1995). Practically, this is akin to assuming that any transition, be they between offices, income categories or events, is just as likely as any other. Other researchers have tried a purely empirical approach, using observed transition rates to assign costs of replacing one state with another (Rohwer & Potter 2005). Observed transition rates, however, reflect initial distributions of offices and officeholders as well as the costs of making individual transitions. Transition rates for extremely rare transitions, for example, can unduly affect the minimization process. For many applications, it might also be unclear whether observed data adequately represent the true transition probabilities. Finally, it is possible that observed transition rates will vary over a period of study. Neither the agnostic solution (no differentiation between replacement costs) nor the empirically-driven method is particularly appealing here.

Second, I assume that transitions within each level of government are easier to achieve than transitions between levels of government. Thus, an additional cost of 1 is assigned to replacements of: 1. a federal with a state job, 2. a federal with a local job, or 3. a state with a local job. Finally, I assume that transitions between jobs with similar functions are easier to achieve than transitions involving jobs with dissimilar functions. Thus, I assign an additional cost of 1 to replacements that involve transitions between administrative, executive, judicial and legislative functions.

None of these assumptions is likely to be exactly true in the real world. Term lengths and regular elections make it difficult to persist in an elective post. Similarly, both empirical research and common sense suggest that transition probabilities are likely to be asymmetric. A member of Congress, for example, is likely to find the transition to a state legislative post easy to pull off. The transition from the state legislature to Congress, on the other hand, can be exceedingly difficult. Some assumptions, however, are necessary to structure the algorithm so that it produces meaningful distances for analysis. As discussed above, sequence analysis is an exploratory tool and the efficacy of any assumptions about substitution costs must be weighed against the results they produce. The cost assumptions made here are grounded in past empirical work and are intended to be first approximations of the costs associated with transitions between various public-sector jobs in the U.S. federal system.[37]

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[37] To assess the importance of these costs assumptions, I compared the distances produced under different sets of substitution rules (results not shown). For example, I calculated distances where only transitions between jobs were penalized (i.e., no additional penalty for transitions between levels of government or job functions). I also calculated distances without an additional penalty for levels and without an additional penalty for job functions. The distances returned by the OM algorithm under these various costs assumptions correlate at .84 or above and, in most cases, .95 or above. Nonetheless, the matrix of substitution costs does shape the results of the clustering operations used to partition the distances returned

In addition to the replacement costs (which vary from 0 to 3) described above, each indel operation was assigned a cost of 1.5, or one-half of the mostly costly replacement. Setting the indel cost too low would render the other costs superfluous, as any replacement can be effected via one deletion and one insertion. So, for example, the cost of replacing a local legislative post for a cabinet position, as unlikely a transition as one can imagine, is set at 3 (the basic replacement cost of 1, an additional cost of 1 for the transition between levels of government, and an additional cost of 1 for the transition between functions). The same transformation can be accomplished by deleting B and inserting C. Similarly, the cost of replacing a federal judicial post with a state judicial post is set at 2 (1 for changing job types plus 1 for changing levels).

Using the OM algorithm, I calculated the minimum cost of transforming one sequence into another for every pairwise combination of pre-mayoral career sequences (228,150 pairwise combinations). The algorithm returned a matrix of distances that captures differences in the pre-mayoral careers of all 676 incumbents in the dataset. Since pre-mayoral careers vary substantially in length, the unstandardized distances are likely to be heavily influenced by the disparity in sequence lengths. The potential distance between a short and long sequence is greater than for two sequences of equal length (Brzinsky-Fay, Kohler & Luniak 2006). I correct for this problem by dividing each pairwise distance by the length of the longest sequence in the dataset (44 years). These standardized distances, which capture the basic differences in the office-holding

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by the OM algorithm. How important the various costs assumptions are, in general, to the results one obtains is a topic that warrants further theoretical and empirical study.

experiences prior to assuming the mayoralty, form the raw material for the cluster and event history analyses described below.

3. Cluster Analysis of Pre-Mayoral Careers

The OM algorithm returns a matrix of distances that captures the pairwise differences in the experiences of mayors prior to assuming the office. These distances form the input data for standard cluster analysis and multi-dimensional scaling programs, which enable the analyst to recover relevant groupings or dimensions in the data. The matrix of distances returned by the OM computer algorithm was analyzed using Ward's hierarchical clustering method (1963). The procedure begins with each of the 676 mayors in its own cluster or group. Pre-mayoral careers are then successively joined until a single cluster with all 676 mayors is reached. At each joining of one mayor or group of mayors with another, Ward's method attempts to minimize the loss of information that results. Each possible pair of clusters is considered; the procedure selects the cluster that minimizes the error sum of squares defined by the following formula:

$$ESS = \sum_{i=1}^{n}(x_i - x_{mean})^2$$

This error sum of squares criterion distinguishes Ward's method from other agglomerative clustering techniques (Everitt 1993).

One drawback of cluster analysis procedures is that they do not identify an optimal number of groups. Indeed, some techniques require the analyst to stipulate a desired number of clusters *a priori*. Scholars have devised several techniques to assist in

the selection of the optimal number of groups. These are usually referred to as stopping rules (Milligan & Cooper 1984; Everitt 1993). Ultimately, whether a four-group solution is superior to a three-group solution, for example, is a subjective judgment that the analyst must make. As with the problem of determining the costs of various replacement and indel operations discussed above, there is no substitute for detailed knowledge of the subject matter being investigated.

In selecting the number of clusters, the analyst confronts two types of decision error. The first type occurs when a stopping rule produces a solution with more groups than are actually present. The second kind of error occurs when the stopping rule yields fewer clusters than are actually present. Of the two errors, the second is more serious in applied settings. Here, the merging of distinct clusters results in a loss of information. Of the various stopping rules proposed by scholars, the Calinski-Harabasz (1974) pseudo-F index has gained wide acceptance, outperforming many other measures in Monte Carlo studies (Milligan & Cooper 1984). The index is computed by

$$[\text{ trace } B / (k-1)] / [\text{ trace } W / (n-k)]$$

where n is the number of objects, k is the number of clusters, B is the between-cluster sum of squares and W is the within-cluster sum of squares. Larger values of the statistic indicate more distinct clustering.

Calinski-Harabasz pseudo-F statistics were calculated for 11 possible grouping solutions for the 676 pre-mayoral careers. Of these, the two- and three-group solutions register the largest values (165.17 and 165.08, respectively). The two-group solution distinguishes between those with political experience prior to becoming mayor and those without. The three-group solution further divides the former class into a small group of

mayors elected following lengthy stints in city administration or on the city council, and a large residual category. These are meaningful distinctions that begin to illuminate the primary differences among the various paths to the mayoralty. Nonetheless, both solutions obscure interesting patterns among those with substantial political experiences before becoming mayor. A more detailed grouping solution is needed to fully describe the salient differences among pre-mayoral careers.

In examining the remaining solutions, a six-group solution appeared to best fit the data. This solution also has the largest pseudo-F statistic (126.20) among the remaining groupings. The six clusters are described in Table 6.2. The largest cluster, accounting for nearly half of the mayors in the sample, bears the name "Political Amateur." Mayors in this cluster assume the office with little or no previous political experience. The next largest category, "Journeyman," includes mayors who occupied a mix of federal, state and local offices prior to running city hall. In contrast, those labeled "Local Apprentice" spent their usually brief pre-mayoral career in local offices. The last three categories are smaller and distinguished primarily by the length and content of their pre-mayoral service. The "Federal-State Interloper" cluster identifies mayors that occupied state and federal offices before assuming the mayoralty. The "City Bureaucrat" and "Council Vet" clusters identify mayors that spent substantial time in local offices.

Table 6.2. Description of Pre-Mayoral Clusters

Cluster	N	# Levels	# Functions	# Offices	Yrs. Public Service	Description	Sample Career
Journeyman	148	1.58	1.64	2.86	11.89	Medium, Federal, State + Local Mix	RRRKKKKM
Local Apprentice	101	1.30	1.53	2.29	9.70	Short, Local Offices	BBBBM
Political Amateur	331	0.70	0.72	0.96	1.58	Short, Few Offices or None	M
Federal-State Interloper	57	1.82	1.56	2.98	14.37	Long, Federal, State Legislature	RRRRRRRRRRM
City Bureaucrat	18	1.33	1.61	3.89	25.78	Long, Local Administration	QQQQQQQQQQQQQQQQQM
Council Vet	21	1.33	1.52	2.24	22.95	Long, Local Legislature	BBBBBBBBBBBBBBM

Note: Numbers in the third through sixth columns are cluster means. B = Local Legislative; K = Local Law Enforcement; M = Mayor; R = State Legislative; Q = Local Administrative.

The pre-mayoral career paths described in Table 6.2 can be analyzed in a number of ways. In Chapter 5, I compare the distribution of these pre-mayoral career paths across time, showing the steady disappearance of Political Amateurs and increasing diversity of pre-mayoral careers in the 20th century. It is also possible to relate membership in these clusters to individual differences (e.g., age and education), and aspects of the local setting (e.g., city size) in which mayors served. The latter include differences in the institutional setting, such as the length of the mayoral term and term limits. Nonetheless, for the present purposes, the main result of the cluster analysis procedures described above is the partitioning of mayors into a small number of meaningful paths to office. These paths constitute a novel measure of previous political experience that can be used to explain what mayors do while in office.

4. Event History Analysis of the Mayoral Career

To determine if what mayors do while in office is influenced by how they got there, I used the pre-mayoral career paths described above in an event history analysis of mayoral tenure. The analysis encompassed three stages. In the first stage, a reelection model was estimated using election returns from 450 elections in 15 cities that featured mayoral incumbents running for reelection. In the second stage, the coefficients from the reelection model were used to generate a prediction of the probability of winning for each mayor in each year of their mayoral career. In the third stage, a competing risks hazard model was estimated to assess the effects of electoral danger, personal attributes, local institutions and previous political experience on the decision to stay in office, retire or seek another office.

To assess the usefulness of the career paths as a measure of individuals' previous political experience, I reran these models for two alternative measures. The first measure, HELD PREVIOUS OFFICE, indicates that a member held an elective office prior to becoming mayor. The second measure, YEARS PUBLIC SERVICE, counts the number of years spent in public service before winning the mayoralty. In comparing these three measures of previous political experience, I am able to assess both whether experience matters and the extent to which the relationship between experience and behavior depends on how the former is measured.

4.1. Mayoral Reelection

Over the period of study, there were 1,031 direct elections for mayor in the 15 cities studied here.[38] In 513 of these elections, a mayoral incumbent ran for reelection, winning approximately 74 percent of the time. The 74-percent success rate suggests that sitting mayors enjoy a substantial incumbency advantage, though the rate of reelection is below levels typically observed for the U.S. House of Representatives. Past studies of congressional elections find that reelection is a function of a variety of factors, including individual attributes, electoral system institutions and the electoral environment (Jacobson 2008). I attempted to incorporate each of these factors in the model below.

Of these factors, data on the electoral environment was the most difficult to collect. Using election returns data from the *Dictionary* and other sources, I was able to construct a previous margin variable (MARGIN) with observations from 450 of the 513

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[38] The analysis excludes mayors from Cincinnati after 1925 and Cleveland between 1923 and 1930. These mayors served under council-manager plans and were not directly elected by voters.

elections featuring a mayoral incumbent. Margins for appointed rather than elected incumbents was set to zero and a dummy variable (APPOINTED) was included to denote mayors of the former type. I expect a positive relationship between margin and winning and a negative relationship between appointed and winning. I also include a dummy variable for races featuring at least one former mayoral incumbent running against the current officeholder. Former mayors present formidable opponents and, I expect, will reduce the probability of winning.

The most crucial individual attribute included in the model is a measure of previous political experience based on the pre-mayoral career paths described above. Existing research on congressional and other elections often ignores previous experience. To simplify the presentation, I collapse the six pre-mayoral career paths into three categories. I group the Political Amateur and Local Apprentice paths into a single category, indicated by the dummy AMATEUR. Similarly, the City Bureaucrat and Council Vet paths are grouped together and denoted by LOCAL CAREERIST. The two remaining career paths, Journeyman and Federal-State Interloper (both highly professionalized paths) form the omitted category in the analyses that follow.[39] I expect that, controlling for other factors, those in the amateur and local careerist categories will be less likely to win reelection. These incumbents have the least experience running election campaigns. They also have fewer accomplishments on their resume than those in the omitted categories. I also include an interaction of amateur and former mayor to

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[39] The substantive results reported below do not change much when dummy variables for five of the six clusters are used in lieu of the three-group model described here.

assess whether the impact of the latter is more pronounced in races involving inexperienced incumbents.

The reelection model also includes controls for years in office, city size and annual growth. LOG(DURATION) takes the log transformation of years spent in the mayor's office. The LOG POPULATION variable takes the log transformation of yearly population interpolated from decennial census data. The variable CHANGE POPULATION measures the percent change in population over the previous year. With measures of mayoral performance difficult to come by, this latter variable is a proxy for how the city is doing economically. To assess differences in the institutional setting, I also include a measure of the length of the mayoral term. Finally, to account for unmeasured characteristics of the local setting, e.g., the preferences and expectations of local residents with respect to mayoral candidates, I include city fixed effects.

4.2. Voluntary Termination of the Mayoral Career

Using the reelection models described above, a prediction of the probability of winning reelection was generated for each incumbent in each year of their mayoral tenure.[40] This prediction was used, alongside measures of individual attributes, electoral system institutions and the local setting, to model voluntary termination of the mayoral career. In any given year, a mayoral incumbent can opt to stay (i.e., run for reelection or, if it is a non-election year, remain in office), retire or seek another office. These competing risks are captured in a trichotomous dependent variable that takes the value 0

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[40] I also tried (results not shown) setting the probability of winning to zero for years more than two years out from the next scheduled reelection contest. The results were not appreciably different from those reported below.

if an incumbent attempts to remain in office, 1 if the incumbent retires and 2 if the

incumbent seeks another office. The risks of leaving office via retirement or moving up

are modeled using the multinomial logit procedure.[41]

In modeling the risks of voluntary termination, it is important to account for

duration dependency, i.e., the possibility that an individual's decision to stay, retire or

seek another office is influenced by decisions made previously. Failing to account for

duration dependency in a multinomial logit framework is akin to assuming that the

hazard rate is flat with respect to time (Box-Steffensmeier & Jones 2004). Empirical

researchers have employed several strategies to account for duration dependency in

discrete-time processes, including the inclusion of dummy variables for each year in

office and transformations of duration values. The latter approach has the advantage of

parsimony, using fewer degrees of freedom and simplifying the characterization of the

baseline hazard rate. After considering a variety of alternative specifications, a natural

log transformation of duration values was chosen.[42]

As with the reelection model, there was some attrition due to missing election

returns. I was able to recover a measure of previous margin for 503 of 654 eligible

incumbents. This variable is necessary for generating a prediction of the probability of

winning, PROB WINNING. Consistent with past research on congressional careers

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[41] The multinomial logit estimator assumes independence of irrelevant alternatives (IIA). All of the competing risks models reported below passed the specification tests proposed by Hausman & McFadden (1984) and Small & Hsiao (1985). Additionally, a multinomial probit procedure was performed on the pre-mayoral career paths model to measure previous political experience. The results are nearly identical to those of the multinomial logit model.

[42] I compared linear, natural log, quadratic and cubic spline transformations against the null model and saturated model with dummies for each year in office (results not shown). Each of the transformations was superior to the null model. The saturated model did account for more variance, albeit at a cost of many degrees of freedom (tenure ranges from 1 to 29 in the dataset). The natural log transformation appears to fit the data better than other specifications. In any event, the substantive results do not change when other transformations are used.

(Jones 1994, Kernell 2003), I expect this term to be negatively associated with retirement. With respect to moving up, it is possible that those whose reelection prospects are good will be less likely to go elsewhere – i.e., electoral danger does not compel exit via ambition. However, endangered incumbents are probably equally likely to lose races for other offices. Incumbents that are likely to win reelection are also best poised to take advantage of opportunities for advancement. Thus, I expect the probability of winning to have a mild positive effect on moving up.

In addition to the expected probability of winning, I include the same measures of previous political experience and electoral institutions that were used in the incumbent reelection model. I also control for age, education, city size and growth. In doing so, I am able to assess whether the path to office influences the retirement decision independently of its impact on reelection. With respect to those in the amateur category, there is reason to believe that the pre-mayoral career will register an independent effect. Many amateurs probably had "discrete" office goals (Schlesinger 1966), preferring to give up their office rather than seek another term.[43] I expect the amateur category to have a positive effect on retirement. For the same reasons, amateurs might be less inclined to seek other offices. However, those in the amateur category are also just starting their political careers. Few have established local careers and, perhaps having ample time and resources, might be inclined to seek other offices. Thus, the predicted

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[43] Consider the following anecdote about a certain mayor of Cleveland in the mid-19[th] century:

> In 1865, while on a business trip, [Herman] Chapin was nominated as the Republican candidate for mayor. He expected to lose the election and was astonished by his … victory. Chapin tried to refuse the "prize" of election but reluctantly agreed to serve for patriotic reasons. … He had no desire to continue in politics and would not seek a second term in 1867, completely ending his political career (*Dictionary*, p. 63).

effect is uncertain. I expect local careerists to exhibit the opposite patterns. Having served long stints in local government, they have few good alternatives to sticking around. The local careerist category ought to be negatively associated with retirement and ambition.

Consistent with past work on other offices, I expect the institutional setting to exert a powerful effect on retirement. In particular, those serving in cities with longer mayoral terms will be less likely to retire. In addition to facing reelection less frequently, those elected to three- and four-year terms tended to serve in cities where the mayoralty was powerful and prestigious. With respect to ambition, length of term has two countervailing effects. Those serving lengthier terms have more opportunities and greater political capacity to go elsewhere. On the other hand, the prestige of the office means that doing so is far less attractive. Like the offices of governor and senator, the mayor's office has developed into a destination in its own right. Thus, I expect term length to be negatively related to both retirement and ambition. For similar reasons, I expect the erection of term limits to be positively related with retirement and ambition. Consistent with past research, I expect term limits to increase "progressive" ambition.

4.3. Results

Table 6.3 contains the results of the three incumbent reelection models (one for each measure of previous political experience) described above. The dependent variable is a binary indicator of whether the incumbent won reelection or was defeated. Table 6.4 converts the coefficients in Table 6.3 into first differences (King, Tomz & Wittenberg 2000; Tomz, Wittenberg & King 2003). The results mostly conform to the expectations

stated above. The entry of a former mayor reduces the probability of winning reelection in all three models. Appointed incumbents appear to fare less well, though the effect is less consistent. Previous margin has a large impact on reelection. Changing this term from six to 30 percent, from a narrow to comfortable victory, increases the probability of reelection by .09.

Table 6.3 facilitates a comparison of the three alternative measures of previous political experience. In the first column, the coefficient for previous elective office is positive and statistically significant at the .10 level. The coefficient for years in public service, however, is not significant. In the third column, the two variables indicating the incumbent's pre-mayoral career path are correctly signed and statistically significant. Those who reach the mayoralty via the amateur or local careerist routes to office are less successful in winning reelection. Moving from the omitted to the amateur category, for example, reduces the probability of winning by .13. Moving from the omitted to local careerist path results in a hefty reduction in the probability of winning of .22. The Akaike information criterion (AIC) for the third model is lower than for the two alternatives.[44] While this fact does not prove the superiority of the model with pre-mayoral career paths, it indicates that there is no significant penalty for incorporating more detailed knowledge of previous experience.

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[44] The AIC facilitates comparative assessments of the fit of non-nested models. The AIC is computed by the following formula: AIC = -2 (log-likelihood) + 2 (c + p + 1), where c is the number of covariates, and p is the number of structural parameters. The AIC rewards parsimonious models by penalizing the log-likelihood when additional parameters are added to a model. All else equal, models with lower AIC values are preferable (see Box-Steffensmeier & Jones 2004, pp. 43-45 for a more detailed discussion).

Table 6.3. Three Fixed Effects Models of Mayoral Reelection

	I	II	III
Log(Duration)	-.253	-.242	-.292
	(1.34)	(1.29)	(1.46)
Held Previous Office	.500*		
	(1.94)		
Years of Public Service		.005	
		(0.28)	
Amateur			-.718**
			(2.38)
Local Careerist			-1.110**
			(2.28)
Appointed	-.953*	-.844	-.971*
	(1.70)	(1.28)	(1.69)
Former Mayor	-2.075**	-1.128**	-2.782***
	(2.29)	(2.44)	(3.09)
Former Mayor * Amateur			2.584**
			(2.41)
Margin	.024***	.024***	.026***
	(3.48)	(3.59)	(3.76)
Term Length	.068	.078	.091
	(0.38)	(0.44)	(0.50)
Term Limit	.325*	.334*	.383**
	(1.81)	(1.88)	(1.98)
Log Population	-.074	-.074	-.075
	(0.56)	(0.56)	(0.55)
Change Population	-.020	-.020	-.018
	(0.86)	(0.85)	(0.77)
Age	-.015	-.015	-.011
	(0.97)	(0.94)	(0.68)
Education	.224**	.206*	.190*
	(2.08)	(1.89)	(1.70)
Constant	1.232	1.504	2.157
	(0.79)	(0.97)	(1.33)
Log-Likelihood	-225.25	-227.10	-220.70
AIC	500.50	504.19	495.39
N	450	450	450

NOTE: Numbers are logit coefficients with t-stats in parentheses. Coefficients for city fixed effects not shown.

* p < .10, ** p < .05, *** p < .01

Table 6.4. Changes in the Probability of Reelection

Changing this variable …	from …	to …	changes the prob. of reelection by...	Lower Bound	Upper bound
Duration	1	2	-.03	-.07	.01
Amateur	No	Yes	**-.13**	-.26	-.03
Local Careerist	No	Yes	**-.22**	-.45	-.02
Appointed	0	1	-.19	-.44	.02
Former Mayor in Race	0	1	**-.55**	-78	-.19
Amateur * Former Mayor	0	1	-.19	-.46	.04
Margin[a]	6.38	30.52	**.09**	.03	.18
Term Length	2	4	.03	-.08	.16
Term Limit	0	4	.14	-.01	.32
Log Population[a]	11.59	13.60	-.03	-.13	.05
Change Population[a]	.50	4.55	-.01	-.05	.02
Age[a]	44	57	-.03	-.11	.03
Education	High School	Some College	.03	-.00	.08

NOTE: The probabilities depicted here are generated from Table 6.3. The baseline probability of reelection, i.e., when all variables are set to their medians is .79. These baseline probabilities apply to members of the omitted career path categories. Boldface indicates differences are significant at the .05 level. Upper and lower bounds denote boundaries of the critical interval for each estimate.
[a] These values correspond to the 25^{th} and 75^{th} percentiles.

The results of the three competing risks models of voluntary termination of the

mayoral career, summarized in Table 6.5, are also mostly consistent with the predictions

stated above. Most important, previous political experience appears to influence retirement independently of its effects on reelection. The coefficient for the amateur category is positive and significant at the .10 level. Similarly, those in the amateur category are more likely to leave the mayoralty via ambition. The pre-mayoral career path measure of previous experience seems superior to the other two measures, which have no discernible effect on retirement and a negligible impact on ambition. The third model also outperforms the other two in accounting for variation in voluntary termination and registers the lowest AIC value. Table 6.6 converts the multinomial logit coefficients to first differences. With all variables set to their medians, those in the amateur category are more likely to retire (the probability increases by .02) and more likely to seek another office (a nearly one percent increase) in any given year. These probabilities, while small in absolute terms, are sizeable with respect to the baseline hazard rate and impressive given that they persist even after the indirect effects of experience (i.e., their impact on reelection) have been accounted for.

Table 6.5. Three Competing Risks Models of Mayoral Retirement

	Retire vs. Running	Move Up vs. Running	Retire vs. Running	Move Up vs. Running	Retire vs. Running	Move Up vs. Running
Log(Duration)	1.15***	1.438***	1.139***	1.397***	1.157***	1.483***
	(10.55)	(3.44)	(10.45)	(3.45)	(10.54)	(3.51)
Held Previous Office	-.089	-.410				
	(0.64)	(0.79)				
Years of Public Service			-.011	-.075*		
			(1.16)	(1.95)		
Amateur					.266*	1.400**
					(1.69)	(2.07)
Local Careerist					-.091	1.168
					(0.31)	(1.24)
Term Length	-.829***	-1.262***	-.826***	-1.260***	-.822***	-1.325***
	(8.94)	(3.63)	(8.93)	(3.62)	(8.82)	(3.72)
Term Limit	.165***	.128	.165***	.112	.154***	.031
	(3.99)	(1.07)	(3.97)	(0.94)	(3.68)	(0.24)
Predicted Prob. Winning	-1.779***	2.936	-1.812***	4.170*	-1.826***	3.743*
	(3.89)	(1.41)	(3.83)	(1.85)	(4.15)	(1.67)
Log Population	-.184***	.227	-.171**	.292	-.169***	.296
	(3.06)	(1.14)	(2.86)	(1.08)	(2.81)	(1.07)
Change Population	.005	.290	-.003	-.033	.002	-.029
	(0.31)	(0.87)	(0.19)	(1.29)	(0.16)	(0.30)
Age	-.008	.027	-.006	.043	-.004	.037
	(1.01)	(1.02)	(0.75)	(1.59)	(0.55)	(1.27)
Education	-.019	-.089	-.011	-.059	-.003	.018
	(0.31)	(0.42)	(0.17)	(0.32)	(0.05)	(0.08)
Constant	3.163***	-9.188**	2.985***	-11.433***	2.608***	-12.427***
	(3.95)	(2.41)	(3.65)	(2.79)	(3.10)	(2.75)
Log-Likelihood		-887.83		-885.88		-883.50
AIC		1795.67		1791.76		1789.00
N		2143		2143		2143

NOTE: Numbers are multinomial logit coefficients with t-stats in parentheses. * p < .10, ** p < .05, *** p < .01

Table 6.6 also includes first differences for term length and term limits, two important aspects of the local institutional setting. As expected, longer mayoral terms are associated with lower hazards of retiring. Changing the mayoral term from two to four years effectively reduces the probability of retirement by .13. Term length also has a negative effect on moves to other offices. Changing the mayoral term from two to four years reduces the probability of seeking another office by nearly one percent in a given year. These are the largest effects in the model. Similarly, imposing a term limit of four years in a city which previously had no term limits increases the probability of retirement by .06. Surprisingly, term limits do not appear to increase the probability of moving to another office. Perhaps this result reflects the period of study. Many cities adopted term limits in the late 19[th] century only to abandon them later on. In cities, like San Francisco, that adopted them again in the 20[th] century, term limits did impact mayoral tenure. However, several of the cities studied here, including Los Angeles and New York, imposed term limits after 1980.[45]

Finally, the expected probability of winning powerfully shapes the decisions of mayors about whether to stay on, retire or seek another office. Changing the probability of winning from .64 to .88 reduces the probability of retirement by .03. Similarly, changing the probability of winning from .45 to .64 (from a narrow defeat to easy victory) reduces the hazard of retiring by four percent. To my knowledge, this is the first study to demonstrate the phenomenon of strategic retirement for big city mayors.

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[45] Term limits in San Francisco led Dianne Feinstein, a local politician who assumed the mayoralty after her predecessor was assassinated, to run for governor and senator. In Los Angeles and New York, term limits effectively reduced mayoral tenure in the last 20 years, as the examples of Richard Riordan and Rudolph Giuliani demonstrate. Both mayors would have continued to serve had their respective local charters allowed it.

Interestingly enough, expectations about the probability of winning appear to have a less consistent effect on moves to other offices. The coefficient has the expected sign, but only just reaches conventional levels of statistical significance. Perhaps this weak finding reflects the ambivalence of mayoral incumbents described above. Increasingly, big city mayors are well-poised to seek political opportunities elsewhere. With the prestige of the office increasing substantially in the 20[th] century, however, the inclination to do so is much less than it used to be.[46]

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[46] The lack of movement from the mayor's office to other high offices has been lamented by past studies of mayoral careers (Gittell 1963; Murphy 1980). Only one big city mayor has succeeded to the U.S. presidency (Grover Cleveland, of Buffalo, who first became Governor of New York), although several have served in the Cabinet (e.g., David Francis of St. Louis and Anthony Celebrezze of Cleveland) and many have been governors (e.g., Hazen Pingree of Detroit) and senators (e.g., lately, Dianne Feinstein, and George Voinovitch of Cleveland). Indeed, Mayor James Curley of Boston once remarked that "being Mayor is fun and exciting, but there is no future in it." The absence of a lengthy post-mayoral career indicates that, for most incumbents, the mayoralty is the object of ambition rather than a means to an end.

Table 6.6. Changes in the Probability of Retiring, Moving Up

			RETIRING			MOVING UP		
Changing this variable ...	*from ...*	*to ...*	*changes the prob. of ... by*	*Lower bound*	*Upper bound*	*changes the prob. of ... by*	*Lower bound*	*Upper bound*
Duration	1	2	**.03**	.02	.03	**.001**	.000	.002
Amateur	No	Yes	.02[b]	-.01	.05	**.007**	.001	.014
Local Careerist	No	Yes	-.00	-.04	.03	.007	-.001	.025
Predicted Prob. Win.	.64	.88	**-.03**	-.05	-.02	.002[b]	.000	.006
Term Length	2	4	**-.13**	-.16	-.10	**-.007**	-.017	-.002
Term Limit	0	4	**.06**	.02	.10	.001	-.002	.005
Log Population[a]	12.15	13.66	**-.02**	-.03	-.01	.001	-.001	.004
Change Population[a]	.08	4.02	.00	-.01	.01	-.000	-.003	.001
Age[a]	44	57	-.00	-.02	.01	.001	-.001	.004
Education	High School	Some College	.00	-.01	.01	.000	-.001	.001

NOTE: The probabilities depicted here are generated from Table 6.5. The baseline probability of retiring, i.e., when all variables are set to their medians is .08. The baseline probability of moving up is .002. These baseline probabilities apply to members of the omitted career path categories. Boldface indicates differences are significant at the .05 level. Upper and lower bounds denote boundaries of the critical interval for each estimate.
[a] These values correspond to the 25th and 75th percentiles.
[b] Difference is statistically significant at the .10 level.

5. Conclusion

The sequence analysis techniques described in this paper represent a set of tools for uncovering difficult-to-discern patterns in datasets where the unit of analysis is an ordered array or sequence of events rather than an individual event or choice. Past

scholarship has generally modeled the political career as a collection of isolated events or choices generated by a stochastic process. For standard statistical techniques, this independence assumption is necessary. Nonetheless, it ignores potentially important information about the sequence of events. Sequence analysis methods require no assumptions about the data generating process. However, the analyst must make important judgments in deciding how to weight various replacement and indel operations, and in determining the number of clusters to focus on. Thus, like other statistical tools, sequence analysis methods offer no substitute for detailed knowledge of the phenomenon of interest.

The sequence analysis methods described here enabled me to address an important question raised by past research on political careers – whether the behavior of politicians is influenced by how they got to where they are. Using optimal matching and cluster analysis, I was able to partition the pre-mayoral career into a small number of discrete paths. These paths appear to exert a powerful influence on mayoral tenure, both indirectly through their effect on reelection, and directly on personal decisions about whether to stay in office, retire or seek another office. Using this novel measure of previous political experience, I demonstrated that mayoral retirements are both strategic and contingent on local political institutions. Surprisingly, when the effects of previous political experience are accounted for, traditional individual attributes like age and education have little effect on tenure.

Sequence analysis methods can be readily extended to other political careers. The 676 mayors analyzed in this paper are just a small subset of public officials in the U.S. federal system. These methods can also facilitate comparison of career trends across

countries and over time. In Chapter 4, I examine differences among career sequences for other officeholders, including members of the U.S. cabinet, House, Senate, federal judiciary and those serving as governors in the 50 states. Studying the careers of those occupying these very different offices will help further illuminate the impact of national political trends, appointment procedures, electoral system institutions, and internal organization on political ambition. In doing so, I hope to make more concrete the presumed link between how individual politicians reach public office, and political behavior and political institutions.

Political careers represent just one of many phenomena of interest to political scientists that involve sequences of events or choices. Past scholars, for instance, have focused on the path that nations take to modernization (Rostow 1960; Inglehart & Welzel 2005). Economic change, political development (Huntington 1968), revolution (Skocpol 1979) and the rise of nationalism (Deutsch 1961) are all outcomes that scholars have modeled as historical sequences. Contemporary public policy processes, including lawmaking and budgetary processes (Padgett 1980), can be modeled as decision-making sequences. In international relations, researchers have focused on the sequence of events that lead to ethnic conflict and war. Finally, political scientists have offered a variety of cyclical theories to explain critical elections (see Mayhew 2000), presidential leadership (Skowronek 1993) and the resurgence of racism (Woodward 1966). Given the importance of these subjects, the potential contribution that sequence analysis methods can make is substantial.

Chapter 7

Amateurs and Professionals in the Washington Community:
Career Paths and Voluntary Retirement from the House of Representatives

Careers have been studied as thoroughly as regime type, elections, conflict and other important political phenomena. Among the different groups of officeholders, the careers of members of the U.S. Congress have been studied most extensively of all. Unfortunately, though researchers have compiled detailed information on the backgrounds and experiences of legislators (Bogue et al. 1976), empirical research has been unable to show that these characteristics substantially affect legislative behavior. Thus, a "so what" question continues to plague recruitment studies (Matthews 1984). There ample theoretical reasons to expect that differences in who politicians are and how they reach office will impact both political behavior and institutional development. But this link is more often asserted than demonstrated.

One explanation for this disconnect is the difficulty in measuring previous political experience. Whereas information about how politicians reach a particular office is encoded in complex sequences of office-holding events, most measures of experience are comparatively crude. Some studies use binary indicators of whether a candidate has held a particular office or any elective office at all. Others count the number of years an incumbent has occupied the current office, ignoring other office-holding experiences. Differences among officeholders in the number, type and order of offices held are potentially limitless. For those interested in establishing a link between the path to office and political behavior, figuring out which differences to focus on is a difficult problem.

Before abandoning the search for the experience-behavior relationship, it is worth considering whether existing measures of experience adequately capture the differences in the number, type and order of offices occupied. It is possible that previous studies have failed to find a link because the basic differences among career sequences have yet to be systematically measured. Given the substantial resources invested in compiling career data, one might think that the "typical" career, i.e., the modal paths to office, would have been established long ago. Writing in the 1950s, Matthews (1954) observed a "major gap" with respect to the usual pattern or sequence of offices leading to such high offices as the presidency and Congress. Whether or not career patterns vary over time, across offices, between Democrats and Republicans, in one-party or two-party areas, etc., had not been sufficiently explored. More than 50 years later, the gap has narrowed, but questions about the basic patterns among political careers and importance of career sequences are still waiting to be addressed.

In recent years, statistical techniques have been developed that facilitate the analysis of complex sequences of events. In this paper, I demonstrate the usefulness of sequence analysis methods (Abbott 1995; Macindoe & Abbott 2004) for making sense of office-holding sequences. Specifically, I apply an optimal matching algorithm to newly collected data on the pre-House careers of incumbents during five historical eras. This algorithm produces a matrix of distances that capture differences among Representatives in the number, type and order of offices they occupied prior to entering the House. These distances are then analyzed using cluster analysis to identify meaningful groupings, i.e., paths to office, in the data. Substantively, I show that the pre-House career can be

partitioned into a few, recognizable career paths. Moreover, differences in previous experience can help explain behavior in office, in particular reelection and retirement.

This paper proceeds as follows. The next section briefly reviews past work on political careers, highlighting the contributions and shortcomings of individual-level models of career decision-making. The third section describes how career sequences for members of the U.S. House were collected and coded. I then introduce sequence analysis methods and the optimal matching (OM) algorithm used to distinguish differences in sequences of events. The fourth section describes the cluster analysis procedures used to partition the distances returned by the OM algorithm into meaningful groups, or career paths. The fifth section conducts an event history analysis of congressional tenure, showing that career paths can help predict reelection and retirement. In doing so, I compare this measure of previous experience against two alternatives. The final section concludes with a discussion of the potential that sequence analysis methods have for career studies and other sequential data of interest to political scientists.

1. Existing Research on Political Careers

Modern scholarship on careers begins with Polsby's (1968) study of the institutionalization of the U.S. House. Institutionalization is a developmental process that culminates in an organization that is well-differentiated from its external environment (Eisenstadt 1964; Huntington 1965). For empirical researchers, institutionalization poses difficult measurement challenges. Polsby operationalized the concept by collecting data on the tenure of members between 1789 and 1967. Tables showing a decline in turnover (47 to 21 percent) and increase in terms of service (2.11 to 5.65 terms) between 1877 and

1965 indicate that the House had become difficult for outsiders to penetrate. Following Polsby, researchers used similar data to illustrate both the causes and consequences of institutionalization (Bullock 1972; Cooper & West 1981; and Hibbing 1982).

Complementing these studies were efforts to establish a firmer empirical link between institutionalization and rising careerism. Bogue et al. (1976), for example, found that the backgrounds and experiences of those reaching Congress changed very little over the course of history. Thus, one must look to changes inside the House – e.g., stronger committee systems with the seniority rule determining advancement (Polsby, Gallaher & Rundquist 1969; Shepsle 1978) – to explain Polsby's trend. Not all researchers accepted such internal explanations for rising careerism. Several alternative causes have been proposed, including: 1. changes in economic organization that led congressional majorities to enhance institutional capacity (Wiebe 1967; Skowronek 1982; Schickler 2001), 2. changes in party competition that reduced the electoral obstacles to reelection (Price 1971, 1975, 1977), and 3. changes in electoral system institutions that reduced the effectiveness of national party campaigns and encouraged members to cultivate a personal vote (Cain, Ferejohn & Fiorina 1987; Katz & Sala 1996).

These different explanations for rising careerism highlight the fact that the causes of congressional careerism are over-determined. Polsby's trend occurred over a stretch of history populated by multiple institutional reforms and external shocks. In recent years, researchers have moved from aggregate-level analyses to individual-level models of career decision-making. These models, which are used to characterize the choice process facing legislators at regular decision points assume that a better understanding of the individual career calculus is necessary if scholars are to fully comprehend the patterns

in aggregate-level time series (Hall & Van Houweling 1995). Individual-level models have drawn attention to the factors that shape decisions to run for reelection, retire or move to another office. They have also made several methodological contributions, including the use of event history techniques.

Kiewiet & Zeng's (1993) analysis of career decision-making by House members between 1947 and 1986 is the most oft-cited study in this vein. Using a comprehensive dataset that includes 8,353 individual career choices, they estimate the effects of a variety of causal factors, including age, leadership position, majority status, ideological position, and electoral vulnerability. Because these career decisions occurred over an extended period of time, Kiewiet & Zeng are able to assess the impact of institutional reforms (e.g., the subcommittee bill of rights). They are also able to model aspects of the political opportunity structure (Schlesinger 1966), including the availability of an open Senate or gubernatorial seat. Finally, using a multinomial logit procedure, Kiewiet & Zeng are able to simultaneously estimate the effects of these variables on retirement and attempts to seek higher office.

The large-*N* approach, with the multinomial logit procedure allowing the researcher to simultaneously model retirement and ambition, has many attractive qualities. Its implementation by Kiewiet & Zeng (1993), however, requires two caveats. First, the authors fail to disentangle the effects of their independent variables on reelection and retirement. Some variables affect retirement directly, others indirectly through their effects on reelection. Some variables have both effects, and these can point

in different directions.[47] Second, Kiewiet & Zeng treat each of the 8,353 choices included in the analysis as an independent observation. They acknowledge that choices made by the same individual at different decision points are likely to be correlated, but they offer no solution to the problem.

Brady et al. (1999) provide a partial fix to the first problem by estimating separate models for incumbent reelection and the retirement decision. Their focus, however, is on arbitrating between different explanations of rising careerism between 1870 and 1930. The models include variables measuring electoral system change, economic organization, party competition and pork-barreling. The authors find that reelection and retirement are shaped by different factors. Party competition and economic growth both substantially impacted retirement. Terms representing ballot and primary reforms were insignificant. Using a different specification, Kernell (2003) finds greater support for both ballot and primary reforms. In a forthcoming paper, Kernell proposes a two-stage model that purges the reelection effects from several variables (e.g., previous margin) and then estimates their direct effects on retirement.

One solution to the second problem – correlation among choices made by a single individual over multiple decision points – is offered by Jones (1994), who studies retirement using an event history framework. Rather than assume that all choices satisfy the independence assumption, Jones accounts for serial correlation by modeling time explicitly. The baseline hazard rate is modeled with a linear duration term that assumes that the risk of retiring increases linearly with the number of reelection trials. Duration

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[47] With respect to age, for example, researchers have suggested that older incumbents are less successful campaigners (Hibbing 1991). Previous retirement studies, however, find that age is positively associated with retirement rates.

was a significant predictor of both retirement and ambition. Kernell (2003) used a similar event history approach to predict retirement and ambition between 1877 and 1940. These two-stage and event history approaches represent the state-of-the-art among individual-level models of career decision-making. Researchers can allow the baseline hazard rate to assume a variety of forms and assess the fit of alternative specifications (see Box-Steffensmeier & Jones 2004).

1.1. Career Paths

Schlesinger's (1966) study of political ambition remains the most comprehensive effort to address the knowledge gap identified by Matthews (1954). Schlesinger examined the previous political experiences of presidents and vice presidents, members of the cabinet and the Supreme Court. His analysis of the career paths to these offices was mainly descriptive, emphasizing the position occupied just prior to the destination office. Most presidents, vice presidents and nominees, Schlesinger found, emerge from other elective offices; cabinet members tend to rise from lesser posts in the federal bureaucracy; Supreme Court members advance from lesser legal posts. Schlesinger studied governors and senators more intensively, producing elaborate frequency trees that map out the modal routes to each office between 1900 and 1958. He found that most candidates for these offices used relatively few paths. Twelve routes account for 70 percent of governors; 13 routes account for 70 percent of senators.

Given the data collection and conceptual difficulties associated with studying career paths in any detail, it is not surprising that Schlesinger's work, though widely cited and admired, has been largely neglected. Mezey (1970) duplicated parts of Schlesinger's

analysis for the U.S. House. He uncovered 20 distinct paths to the office, but found no relationship between turnover in the state party system and the political experience of representatives. Kernell (1981) took up Schlesinger's claim that a hierarchy of public offices characterized by orderly career paths to high office existed in the U.S. Using data on the career choices of four House cohorts spread over the period 1817 to 1902, Kernell concluded that the status of the House increased markedly during the 19[th] century. Increasing status was not accompanied, however, by the development of an elaborate pre-congressional career. Kernell speculated that decreasing Senate turnover and the declining status of state offices left few opportunities for House members to realize progressive ambitions.

Work on political ambition has been heavily influenced by the move from aggregate-level analyses to individual-level models. Using the strategic politicians framework (Jacobson & Kernell 1981), researchers have identified the correlates of ambition and proposed models to predict which politicians will attempt to seek higher office. Rohde's (1979) analysis of members of the U.S. House was the first study of this kind. Rhode assessed the benefits, risks and costs of seeking a Senate seat or gubernatorial post and compared his predictions with actual transitions to these offices. Rohde's claims were re-analyzed by Brace (1984) using a multivariate probit model. Similar analyses have been employed to study transitions between other pairs of offices, including the move from governor to the U.S. Senate (Codispoti 1987), U.S. House to the Senate (Francis 1993) and House to federal bureaucracy (Palmer & Vogel 1995). A number of researchers have also studied the transition between legislative assemblies in the 50 states and the U.S. House (Berkman 1994; Maestas et al. 2006).

Political scientists know a great deal about who politicians are, but much less about how they reach particular offices (Matthews 1984). Over the past two decades, the strategic politicians or "rational-actor" framework has emerged as the dominant analytical strategy in career studies. Using individual-level models, researchers have demonstrated that career decision-making is shaped by individual attributes, political institutions, party strength and selection rules, and the electoral setting. In recent years, increasingly sophisticated models have been developed to address the deficiencies in traditional maximum likelihood procedures. Unfortunately, few attempts have been made to link this growing knowledge about micro-level decision-making processes to the macro-level career patterns they were originally designed to explain. As a result, most studies pay no attention to career paths and typically ignore previous political experiences.

2. Sequence Methods

Sequence analysis refers to a body of methods that take whole sequences of events as units of analysis, rather than treating each event as an individual data point. In this way, sequence analysis differs from time series methods, which treat a series of events as generated step-by-step via a stochastic process. Stepwise approaches, such as first-order Markov processes and event history analysis, have been the standard methods applied to sequential data in the social sciences (see Abbott 1995). These methods, however, require assumptions about the relationship between adjacent events, and usually ignore information about the ordering of events. Sequence analysis methods can be applied to any ordered listing of events and have been used to study careers (i.e.,

sequences of jobs), lifecycles (sequence of life events, e.g., education, work, retirement) and social phenomena (e.g., sequences of elements in dance performances).

Sequence analysis proceeds in four steps. In the first step, data describing sequences of events, in this case a series of office-holding events, are coded and formatted for analysis. In the second step, an optimal matching (OM) algorithm is used to calculate a distance measure between sequences of events – in this case, pre-House careers. In the third step, exploratory techniques, such as cluster analysis and multi-dimensional scaling, are used to group similar sequences together, in this case similarities among the paths followed to the House. Finally, these groupings of sequences are used as independent or dependent variables in statistical analysis. Here, I use the pre-House career path to predict incumbent reelection and tenure in office. This rest of this section briefly describes the first two steps: data coding and formatting, and the application of the OM algorithm to pre-House career sequences.

2.1. Data and Coding

The data used in this study consist of complete career sequences and other information for 3,041 members of the U.S. House of Representatives listed in the *Biographical Directory of the United States Congress* (Trees 1997). The *Directory* describes the background, employment history, electoral experiences and public accomplishments of more than 12,000 individuals appointed or elected to Congress. Unfortunately, the costs of collecting career sequences for *all* members of the House were prohibitive. In lieu of compiling a complete census, I identified five historical eras

between 1814 and 1940 and collected detailed information on individuals who served in the House during those eras.

The decision rule that I used to select individuals into the dataset was straightforward. Individuals were included if they began their tenure in the U.S. House during any of these five eras: 1814-1822, 1852-1860, 1870-1878, 1894-1900 and 1930-1940. Individuals who began service prior to the start or after the end dates of particular eras were excluded. This sampling scheme yielded five cohorts of individuals. Since each cohort includes all individuals beginning service in an office within a particular era, the sampling scheme allows me to characterize in great detail the House career at five points in U.S. history.

The main disadvantage of the sampling scheme described here is that it does not allow the researcher to precisely measure the causes of the career patterns uncovered by the analysis. This is especially true with respect to the effects of political institutions on the careers of individuals within offices over time. To assess the impact of institutions, it is necessary to collect career sequences before and after they change. Because the effects of institutional changes work their way through the political system over time, long pre- and post-intervals are desirable. The historical eras utilized here are insufficient for examining rigorously the impact of many institutions (e.g., ballot reform, primary elections) identified by scholars. Thus, the conclusions I reach about causes will, of necessity, be speculative.

The procedures used for assembling the sequence of public offices held by each Representative and calculating the distances between them encompassed three steps. In

Step 1, biographical information was transferred from the *Directory* to a database file.[48] Each public-sector job that an individual member held was entered in the order it was occupied. Start and end dates for each office were recorded along with information about the age, education, non-public occupations, political party affiliation and electoral experiences of each individual.

In Step 2, public-sector jobs were further assigned one of 20 values from a typology of local, state and federal offices. Table 7.1 reproduces the typology of offices used here. Each office type was given a letter code to distinguish it from other types. Federal law enforcement offices were all assigned the letter "L." Service in the state legislature is denoted by the letter "R." In Step 3, the sequence of public offices for each Representative was constructed by assembling an "office-year string" for every office in the public career. Each string consists of a letter code for the office repeated once for each year the office was occupied. If a member served in the state legislature for four years, then the string "RRRR" would be added to the sequence. For each Representative, the office-year strings were then concatenated in the order of offices occupied to form a final career sequence.

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[48] Database programs like FileMaker Pro allow coders to design interfaces that use check-boxes, radio buttons, pull-down menus and authentication routines. These tools help minimize typing and other coding errors. Most of the information in the dataset was entered by the author with the assistance of several undergraduate students.

Table 7.1. Classification of Public Sector Jobs

Level	Function			
	ADMINISTRATIVE	EXECUTIVE	JUDICIAL	LEGISLATIVE
FEDERAL	Administrator (F) (*Counsel, FTC*)	President (X)	Federal Judge (J) (*Associate Justice, U.S. Court of Appeals*)	Representative (H)
	Law Enforcement (L) (*U.S. Attorney*)	Cabinet Officer (C) (*U.S. Attorney General*)		Senator (S)
	Diplomat (D) (*Minister to Italy*)			
STATE	Administrator (A) (*Director, State Equalization Board*)	Governor (G)	State Judge (W) (*Chief Justice, Supreme Court of Ohio*)	State Legislature (R)
	Law Enforcement (U) (*District Attorney*)	State Executive (E) (*Secretary of State*)		
LOCAL	Administrator (Q) (*Director, Parks Department*)	Mayor (M)	Local Judge (V) (*Probate Judge*)	City Council (B)
	Law Enforcement (K) (*Police Officer*)	Local Executive (T) (*Deputy Mayor*)		

Note: Letters in parentheses are letter codes used to denote different job types. Positions in italics are examples of the various job types.

Percy Lee Gassaway, (D-OK)

  V   V   V   W   W   W   W   W   W   W   W   H   H

  ϕ R   R   R   R   R   R   R   R   R   R   H   H

Seymour Howe Person, (R-MI)

H = House; R = State Legislative; V = Local Judicial; W = State Judicial

Step 1: Insert element V
Step 2: Replace element R with V
Step 3: Replace R with V
Step 4: Replace R with element W
Step 5: Replace R with W
Step 6: Replace R with W
Step 7: Replace R with W
Step 8: Replace R with W
Step 9: Replace R with W
Step 10: Replace R with W
Step 11: Replace R with W

Figure 7.1. Alignment of Career Sequences for Two Representatives

Figure 7.1 shows complete sequences for two House members in the dataset,

Percy Lee Gassaway (D-OK) and Seymour Howe Person (R-MI). The career sequence

for Percy Gassaway combines three office-year strings. Gassaway was a lawyer who

began his political career in 1923, when he was appointed county judge in Coal County,

Oklahoma. Gassaway won election to the office in 1924 and served until 1926 ("VVV").

He then became a state judge, presiding over the 26^{th} judicial district for eight years

("WWWWWWWW"). Gassaway was elected as a Democrat to the U.S. House in 1934

where he served a single two-year term ("HH"). In 1936, he lost his bid for renomination

and returned to private practice. Seymour Howe Person was also a lawyer who began his career by winning election to the Michigan state assembly in 1915, where he served for six years ("RRRRRR"). After a brief hiatus, he returned to the state legislature as a senator in 1927. He served an additional four years ("RRRR"). An active Republican, Person was elected to the House in 1930, where he served a single two-year term ("HH"). He became a casualty of the Democratic surge in 1932, failing to win reelection. Rather than seek public employment elsewhere, Person resumed his law practice.

2.2. *Optimal Matching*

The problem of measuring differences (i.e., distances) between sequences is solved by a dynamic programming technique called optimal matching. In the version of optimal matching used here, two elementary operations are used to transform one sequence into another. The sequences consist of strings of well-defined elements that can, but need not repeat. The first operation, *replacement*, involves replacing one element with another element. For example, with a simple replacement of the letter "O" for the letter "E," the sequence "PSYCHE" is transformed into "PSYCHO." The second operation, *insertion-deletion*, involves inserting or deleting an element from a sequence. Deleting the letter "G" from "GLOVE" transforms this sequence into "LOVE." Conversely, "LOVE" can be transformed into "GLOVE" with the insertion of the letter "G." Insertion and deletion are equivalent operations and are collectively called *indel*.

The distance (or difference) between two sequences is a function of the number of these elementary operations. Two sequences that require a large number of replacements and indels to transform one into the other are said to be further apart (i.e., more different)

than two sequences that require a small number of operations. For complex sequences, there is typically more than one way to effect a transformation. The minimum distance, defined in terms of the number of elementary operations needed to transform one sequence into another, is referred to as the edit or Levenshtein distance (Levenshtein 1966).

Figure 7.1 provides a solution for transforming the Person sequence into the Gassaway sequence. The first operation involves inserting element "V" (state judicial) at the beginning of the Person sequence, to compensate for Gassaway's longer pre-House career. In steps 2 and 3, element "R" (state legislative) is replaced with "V." Steps four through 11 involve replacements of "R" with element "W" (state judicial). One question that must be answered in calculating a pairwise distance for these two careers is whether the costs of these different replacement operations will be equal. Should the transition between local judicial and state legislative positions, for example, be weighted the same as one between a state judicial office and state legislature? Another question that must be answered is whether these replacement costs will be the same as or different from the cost of adding an additional year of local judicial service to the Person sequence? The answers to these two questions give shape to sequence comparison.

The OM procedure uses the Needleman-Wunsch algorithm (Needleman & Wunsch 1970) to find the least cost solution given the weights assigned by the analyst to various replacement and indel operations. In Figure 7.1, for example, suppose all replacement and indel operations were assigned a cost of 1. Then the least cost solution of transforming the Person sequence into the Gassaway sequence would involve 11 steps, for a total cost of 11. The OM algorithm does allow the researcher to distinguish among

replacement operations and assess different costs for replacements and indels. Since any replacement can be achieved via one deletion and one insertion, setting the cost of indels at less than half of the cost of replacements ensures that the algorithm will use only indels in making a transformation. The various costs of replacements and indels are assembled in a matrix of substitution costs.

2.3. Optimal Matching with Substitution Costs

Specifying substitutions costs is the central theoretical exercise in sequence analysis (Brzinsky-Fay, Kohler & Luniak 2006). In setting costs, the analyst must rely on substantive knowledge of the subject matter. While the absolute magnitude of the costs does not matter, the relative costs of replacement and indel operations give structure to sequence comparison. The OM algorithm is an exploratory tool. Used properly, it can illustrate patterns in sequence data that are difficult to find through traditional methods. Like all statistical methods in the social sciences, however, the tools of sequence analysis are no substitute for detailed knowledge of the phenomena being studied (Macindoe & Abbott 2004).[49]

Past studies of political careers (Schlesinger 1966; Bogue et al. 1976) differentiate public offices by level of government (e.g., local, state, and federal) and the tasks or

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[49] In contrast to the theoretical approach used here to assign substitution costs, some scholars refuse to distinguish among possible substitutions (Dijkstra & Taris 1995). Practically, this is akin to assuming that any transition, be they between offices, income categories or events, is just as likely as any other. Other researchers have tried a purely empirical approach, using observed transition rates to assign costs of replacing one state with another (Rohwer & Potter 2005). Observed transition rates, however, reflect initial distributions of offices and officeholders as well as the costs of making individual transitions. Transition rates for extremely rare transitions, for example, can unduly affect the minimization process. For many applications, it might also be unclear whether observed data adequately represent the true transition probabilities. Finally, it is possible that observed transition rates will vary over a period of study. Neither the agnostic solution (no differentiation between replacement costs) nor the empirically-driven method is particularly appealing here.

functions that an incumbent performs (e.g., administrative, executive, judicial, and legislative). I adopt these two primary distinctions in setting substitution costs here. In particular, I first assume that any two offices with identical job types can be substituted for each other at no cost. However, any substitution of one job type with another incurs a basic penalty of 1. Thus, any two local administrative jobs are substitutable at no cost; but substituting a local administrative with a local law enforcement job entails a cost of 1. Second, I assume that transitions within each level of government are easier to achieve than transitions between levels of government. Thus, an additional cost of 1 is assigned to replacements of: 1. a federal with a state job, 2. a federal with a local job, or 3. a state with a local job. Finally, I assume that transitions between jobs with similar functions are easier to achieve than transitions involving jobs with dissimilar functions. Thus, I assign an additional cost of 1 to replacements that involve transitions between administrative, executive, judicial and legislative functions.

None of these assumptions is likely to be exactly true in the real world. Term lengths and regular elections make it difficult to persist in an elective post. Similarly, both empirical research and common sense suggest that transition probabilities are likely to be asymmetric. A member of Congress, for example, is likely to find the transition to a state legislative post easy to pull off. The transition from the state legislature to Congress, on the other hand, can be exceedingly difficult. Some assumptions, however, are necessary to structure the algorithm so that it produces meaningful distances for analysis. As discussed above, sequence analysis is an exploratory tool and the efficacy of any assumptions about substitution costs must be weighed against the results they produce. The cost assumptions made here are grounded in past empirical work and are

intended to be first approximations of the costs associated with transitions between various public-sector jobs in the U.S. federal system.

In addition to the replacement costs (which vary from 0 to 3) described above, each indel operation was assigned a cost of 1.5, or one-half of the mostly costly replacement. Setting the indel cost too low would render the other costs superfluous, as any replacement can be effected via one deletion and one insertion. So, for example, the cost of replacing a local legislative post for a cabinet position, as unlikely a transition as one can imagine, is set at 3 (the basic replacement cost of 1, an additional cost of 1 for the transition between levels of government, and an additional cost of 1 for the transition between functions). The same transformation can be accomplished by deleting B and inserting C. Similarly, the cost of replacing a federal judicial post with a state judicial post is set at 2 (1 for changing job types plus 1 for changing levels).

Using the OM algorithm, I calculated the minimum cost of transforming one sequence into another for every pairwise combination of pre-House career sequences (4,622,320 pairwise combinations). The algorithm returned a matrix of distances that captures differences in the pre-House careers of all 3,041 individuals in the dataset. Since pre-House careers vary substantially in length, the unstandardized distances are likely to be heavily influenced by the disparity in sequence lengths. The potential distance between a short and long sequence is greater than for two sequences of equal length (Brzinsky-Fay, Kohler & Luniak 2006). I correct for this problem by dividing each pairwise distance by the length of the longest sequence in the dataset (45 years). These standardized distances, which capture the basic differences in the office-holding

experiences prior to entering the House, form the raw material for the cluster and event history analyses described below.

3. Cluster Analysis of Pre-House Careers

The OM algorithm returns a matrix of distances that captures the pairwise differences in the experiences of Representatives prior to entering the House. These distances form the input data for standard cluster analysis and multi-dimensional scaling programs, which enable the researcher to recover relevant groupings or dimensions in the data. The matrix of distances returned by the OM computer algorithm was analyzed using Ward's hierarchical clustering method (1963). The procedure begins with each of the 3,041 pre-House careers in its own cluster or group. Pre-House careers are then successively joined until a single cluster with all 3,041 members is reached. At each joining of one Representative or group of Representatives with another, Ward's method attempts to minimize the loss of information that results. Each possible pair of clusters is considered; the procedure selects the cluster that minimizes the error sum of squares defined by the following formula:

$$ESS = \sum_{i=1}^{n}(x_i - x_{mean})^2$$

This error sum of squares criterion distinguishes Ward's method from other agglomerative clustering techniques (Everitt 1993).

The algorithm returned group indicators for all $n - 1$ cluster solutions. The hierarchy of clusters identified by the clustering procedure is depicted by the dendrogram in Figure 7.2. A dendrogram is a tree diagram that illustrates the arrangement of clusters,

i.e., the successive joining of observations and clusters. The labels in Figure 7.2 describe the career paths for the first eight groupings of pre-House careers. In the two-group solution, for example, the 3,041 Representatives are separated into a first category characterized by medium to long pre-House careers and a second category consisting of individuals with little or no political experience. The three-, four-, five-, six-, seven- and eight-group solutions reflect ever more fine-grained separations of this first category of members.

One drawback of cluster analysis procedures is that they do not identify an optimal number of groups. Indeed, some techniques require the researcher to stipulate a desired number of clusters *a priori*. Scholars have devised several techniques to assist in the selection of the optimal number of groups. These are usually referred to as stopping rules (Milligan & Cooper 1984; Everitt 1993). Ultimately, whether a six-group solution is superior to a five-group solution, for example, is a subjective judgment that the researcher must make. As with the problem of determining the costs of various replacement and indel operations discussed above, there is no substitute for detailed knowledge of the subject matter being investigated.

Figure 7.2. Dendrogram of Pre-House Careers

In selecting the number of clusters, researchers confront two types of decision error. The first type occurs when a stopping rule produces a solution with more groups than are actually present. The second kind of error occurs when the stopping rule yields fewer clusters than are actually present. Of the two errors, the second is more serious in applied settings. Here, the merging of distinct clusters results in a loss of information. Of the various stopping rules proposed by scholars, the Calinski-Harabasz (1974) pseudo-F index has gained wide acceptance, outperforming many other measures in Monte Carlo studies (Milligan & Cooper 1984). The index is computed by

$$[\text{ trace } B / (k-1)] / [\text{ trace } W / (n-k)]$$

where n is the number of objects, k is the number of clusters, B is the between-cluster sum of squares and W is the within-cluster sum of squares. Larger values of the statistic indicate more distinct clustering.

Calinski-Harabasz pseudo-F statistics were calculated for 19 possible grouping solutions for the 3,041 pre-House careers. Of these, the two- and three-group solutions register the largest values (1081.66 and 778.81, respectively). The two-group solution distinguishes between those with political experience prior to entering the House and those without. The three-group solution further divides the former category into a small group of members elected following stints in the state legislature, and a large residual category. These are meaningful distinctions that begin to illuminate the primary differences among the various paths to the House. Nonetheless, both solutions obscure interesting patterns among those with substantial political experiences before entering the House. A more detailed grouping solution is needed to fully describe the salient differences among pre-House careers.

Table 7.2. Description of Pre-House Clusters

Cluster	*N*	# Levels	# Functions	# Offices	Yrs. Public Service	Description	Sample Career
Political Amateur	1417	0.64	0.67	0.76	1.35	Short, Few Offices or None	H
Legislative Careerist	136	1.26	1.44	2.65	14.99	Long, State Legislative	RRRRRRRH
Legislative Apprentice	329	1.28	1.40	2.18	6.05	Medium, State Legislative	RRRH
State Notable	235	1.43	1.81	2.64	12.42	Medium, State Exec., Law Enf.	UUUUUUH
Judge	184	1.62	1.98	2.56	13.52	Long, Fed., State, Local Judicial	VVVVVH
Federal Bureaucrat	165	1.87	1.62	2.58	11.50	Medium, Federal, Admin., Law Enf.	FFFH
Local Sheriff	497	1.60	1.60	2.11	8.61	Medium, Local Law Enf.	KKKKH
Local Careerist	78	1.68	1.73	2.99	25.06	Long, Local Mix	QQQQQQQQQQQQQQQQH

Note: Numbers in the third through sixth columns are cluster means. F = Federal Administrative; H = House; K = Local Law Enforcement; R = State Legislative; Q = Local Administrative; V = Local Judicial.

In examining the remaining solutions, an eight-group solution appeared to best fit the data. This solution also has the largest pseudo-F statistic (456.47) of any solution with more than six categories. The eight clusters are described in Table 7.2. The largest cluster, accounting for nearly half of the Representatives in the sample, bears the name "Political Amateur." Members in this category enter the office with little or no previous political experience. The next largest category, "Local Sheriff," includes Representatives who were in local law enforcement prior to running for Congress. In contrast, those labeled "Legislative Careerist" and "Legislative Apprentice" spent most of their pre-House careers in the state legislature. The other four categories are relatively small and distinguished primarily by the content of their pre-House experiences. The "Local Careerist" category identifies Representatives that had long careers in local office before entering the House. Those labeled "Judge" served lengthy stints on the bench. The "State Notable" and "Federal Bureaucrat" categories identify members that spent substantial time in state and federal administrative or executive offices.

Table 7.3 examines the distribution of the eight clusters across time, using the five historical eras defined above. In contrast to previous work, which finds little variance in the experiences of members over time (Bogue et al. 1976), Table 7.3 reveals several trends. Most apparent is the declining share of Political Amateurs between the first and fifth cohorts. In the early to mid-19[th] century, half of those who entered the House were amateurs. By the start of World War II, amateurs constituted just over one third of House membership. There is a similar decrease in the share of legislative specialists (those in the Legislative Apprentice and Legislative Careerist categories). Making up the difference was a substantial increase in members coming from local offices, especially

law enforcement. Those in the Local Sheriff category accounted for nearly one fourth of

House membership between 1930 and 1940. The State Notable and Federal Bureaucrat

paths also saw modest increases.

Table 7.3. Distribution of Pre-House Career Clusters Across Time

Cluster	Historical Era				
	1814-1822	1852-1860	1870-1878	1894-1900	1930-1940
Political Amateur	53.46	54.29	46.20	47.59	34.92
Legislative Careerist	7.55	4.54	3.13	3.52	4.47
Legislative Apprentice	16.35	11.93	12.36	7.59	6.93
State Notable	3.35	6.05	9.24	9.26	9.38
Judge	5.45	5.71	6.66	6.48	5.77
Federal Bureaucrat	3.14	4.54	5.57	5.56	7.50
Local Sheriff	9.22	11.93	15.22	18.15	24.82
Local Careerist	1.47	1.01	1.63	1.85	6.20

The decline in both amateurs and legislative specialists beginning in the late 19[th]

century probably reflects a number of factors. Table 7.4 considers several of these,

including changes in the individual characteristics of members and electoral system

institutions. Of these, electoral system reforms – adoption of the Australian ballot and

direct primary – appear to be more important. The median age at entry and share with

some college education do vary across the eight categories. Those in the Political

Amateur, for example, have less education on average while State Notables and Local Careerists have more. Differences in the share of those serving in states adopting ballot and primary reforms, however, are much greater. Forty-four percent or more of those in the Federal Bureaucrat, Local Careerist, Local Sheriff and State Notable categories served after reform; only 32 percent of Political Amateurs post-date the secret ballot. Similarly, nearly one third of Local Sheriffs and over half of Local Careerists began House service after the direct primary; only 17 percent of Political Amateurs did likewise.

Table 7.4. Explaining Pre-House Career Clusters

Cluster	Median …		Percent of Cohort …				
	Year Elected	Age at Entry	Post-Ballot	Post-Primary	Some College	South	Democrat
Political Amateur	872	42	31.76	16.51	60.55	22.79	49.54
Legislative Careerist	873	47	31.62	21.32	53.68	37.50	50.00
Legislative Apprentice	870	42	24.62	13.68	58.36	30.09	48.33
State Notable	878	46	44.26	25.53	73.19	39.36	49.36
Judge	874	47	38.59	20.65	58.70	25.00	53.26
Federal Bureaucrat	878	48	46.06	39.09	57.58	13.33	41.21
Local Sheriff	894	45	52.11	32.80	60.76	12.27	54.73
Local Careerist	932	51	65.38	53.85	66.67	14.10	58.97
All	874	44	37.32	21.67	60.90	22.43	50.28

These differences are consistent with past work on House careers. Kernell (1981) has argued that the status of House membership has increased relative to other offices. He observed that the share of members emerging from state legislatures declined during the 19[th] century, while at the same time transitions from the House to higher offices became less frequent. Interestingly, Kernell found little evidence that these changes coincided with more elaborate pre-congressional careers. The figures in Tables 7.2, 7.3 and 7.4 tell a more nuanced story. The pre-House career was increasing in both complexity and diversity. Starting in the late 19[th] century, the House was being populated by a greater share of political professionals, even as the percentage of legislative specialists declined. Increasingly, membership in the House was a privilege conferred on seasoned professionals, not the citizen-politicians of Jacksonian lore.

Finally, much past work argues that electoral system reforms were among the key drivers of increasing congressional careerism (Katz & Sala 1996; Engstrom & Kernell 2005). Ballot reform helped separate the fates of House members from presidents and other politicians at the top of party tickets (Rusk 1970). Primary reform offered members greater access to the ballot in places where party organizations had formerly enforced rotation norms (Kernell 1977). These reforms created incentives for members to cultivate a personal vote (Cain, Ferejohn & Fiorina 1987). The figures in Table 7.4 suggest that the effects of these reforms were more pervasive, contributing as much to the professionalization of the pre-congressional career as to House careerism itself. Given the incompleteness of the data, such conclusions must be speculative. If corroborated by

further research, however, this would constitute an important advance in research on Congress and electoral system institutions more generally.

4. Event History Analysis of the House Career

To determine if what House members do while in office is influenced by how they got there, I used the pre-House career paths described above in an event history analysis of congressional tenure. The analysis builds on the models in Brady et al. (1999), Jones (1994) and Kernell (2003) and encompasses three stages. In the first stage, reelection models were estimated using election returns from 6,074 primary and 5,814 general elections that featured House incumbents running for reelection. In the second stage, the coefficients from these reelection models were used to generate a prediction of the probability of winning for each member in each term of their House career. In the third stage, a competing risks hazard model was estimated to assess the effects of electoral danger, personal attributes, electoral system institutions and previous political experience on the decision to run for reelection, retire or seek another office.

To assess the usefulness of the career paths as a measure of individuals' previous political experience, I reran these models for two alternative measures. The first measure, HELD PREVIOUS OFFICE, indicates that a member held an elective office prior to his congressional service. The second measure, YEARS PUBLIC SERVICE, counts the number of years spent in public service before winning entry to the House. In comparing these three measures of previous political experience, I am able to assess both whether experience matters and the extent to which the relationship between experience and behavior depends on how the former is measured.

4.1. Incumbent Reelection

Over the period of study, tens of thousands of direct elections for U.S. House were held in 48 states. Election returns for members in the 1814-1822 cohort were unavailable. These individuals are excluded from the analyses below.[50] The 2,565 members that remain served approximately 8,037 terms in the House (McKibbin 1997). Due to untimely deaths and a small number of missing observations, the number of reelection choices available for analysis, 7,534, is less than this number. On 6,326 of these occasions, the incumbent opted to run for reelection, winning approximately 82 percent of the time. The 82-percent success rate suggests that sitting Representatives enjoyed a substantial incumbency advantage, though the rate of reelection is below levels typically observed for the modern House. Past studies find that reelection is a function of a variety of factors, including individual attributes, electoral system institutions and the electoral environment (Jacobson 2008). I attempted to incorporate each of these factors in the models below.

Of these factors, data on the electoral environment was the most difficult to collect. Using general election returns data compiled by Swift et al. (2000), I was able to construct a previous margin variable (MARGIN) with observations from 6,126 of the 6,326 election contests featuring a House incumbent. This variable measures the incumbent's margin of victory in the previous general election. For both primary and general reelection, I expect a positive relationship between margin and winning. Because

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[50] Given the different barriers to voting (e.g., property qualifications), electoral system institutions (e.g., general ticket) and party systems – the start of the second cohort roughly corresponds to the beginning of the modern two-party system – in place during this period, the omission of the first cohort probably poses fewer problems than its inclusion might.

the composition of general election voters typically differs markedly from those responsible for nominating party candidates – especially before direct primaries, when candidates were selected at district or state conventions – I expect the relationship to be much stronger in the general reelection model.

The most crucial individual attribute included in the primary and general reelection models is a measure of previous political experience based on the pre-House career paths described above. Existing research on congressional elections often ignores previous experience. To simplify the presentation, I collapsed the eight pre-House career paths into three categories. Those in the Political Amateur category are denoted by the dummy AMATEUR. I grouped the Legislative Careerist and Legislative Apprentice paths together, indicated by the dummy LEGISLATOR. The five remaining career paths (all highly professionalized) form the omitted category in the analyses that follow. I expect that, controlling for other factors, those in the amateur category will be less likely to win reelection. These incumbents have the least experience running election campaigns. They also have fewer accomplishments on their resume than those in the omitted categories. Those in the legislator category do have experience running election campaigns and, as such, will probably fare no better or worse in winning reelection.

Studies of congressional elections and careerism during this period (Katz & Sala 1996; Kernell 2003) have demonstrated the importance of electoral system reforms in reorienting the incentives of House incumbents. The first of these reforms was the Australian ballot, adopted in most states between 1890 and 1910 (Ludington 1911; Albright 1942; Rusk 1970). The dummy variable BALLOT takes the value 1 if a member was elected in a state that previously passed ballot reform. Consistent with past

work, I expect a positive relationship between ballot and reelection. To further illustrate the effects of ballot reform, I interacted ballot with the amateur and legislator dummies described above. I also interacted ballot with FRESHMAN, which takes the value 1 if the member is in his first term. I expect that the positive effects of ballot reform will extend to each of these vulnerable groups of incumbents (i.e., positive coefficients).

The second important reform was the direct primary, adopted in states starting in the first decade of the 20[th] century (Merriam & Overacker 1928). The dummy PRIMARY takes the value 1 if a member was elected in a state that previously passed direct primaries for congressional elections. Given the rarity of primary defeats, it is likely that this reform had little direct effect on reelection. However, primaries did impact House members serving in places where rotation norms were common. Kernell (1977) argued that rotation practices were an important impediment to members' desire for lengthy House careers. Primary reform obviated these practices by guaranteeing equal access to the party ballot. To measure the effects of rotation, I included a dummy variable, SOPHOMORE, denoting members in their second term. This variable is interacted with primary to distinguish the post-reform era. Consistent with previous work (Kernell 2003), I expect sophomore to be negatively associated with primary reelection, with the effect disappearing in the post-reform era.

The primary and general reelection models include controls for age, ideology, years in office, region, special elections, at large districts and state party disputes. The variable AGE measures each incumbent's age at the beginning of the current term. The variable PARTY DIF measures the absolute difference between a member's ideal point and his party's median ideal point, as measured by the first dimension of the Poole-

Rosenthal DW-NOMINATE scores (Poole & Rosenthal 1997). LOG(DURATION) takes the log transformation of years spent in the House. SOUTH takes the value 1 if the member's district is in one of the 11 states of the Confederacy. The absence of two-party competition in the South contributed to higher reelection rates. SPEC ELECT indicates members who reached office via a special election. The AT LARGE variable denotes members elected from districts in large states that, due to irregularities in the redistricting process, represented statewide constituencies (Martis 1982). FACTION indicates the occurrence of a dispute that led one or more factions in the state party organization to bolt the convention or offer an alternative slate of candidates (Bensel 2000). I expect all three of these latter variables to be negatively associated with reelection.

Finally, the general reelection model includes two additional measures of the electoral setting. The dummy variable PRES ELECT indicates that the election contest occurred in a presidential election year. In these years, the reelection prospects of House incumbents often rested on the popularity of whatever presidential candidate adorned the top of the ticket. Some members during this period were able to ride the coattails of popular presidents or candidates to reelection. More common was the opposite scenario – a lackluster or unpopular candidate at the top of the ticket dragging down the electoral fortunes of co-partisans. The variable BUS CYCLE measures the state of the economy in October of the year an election is held. I expect that the in-party (the party controlling the presidency) will benefit when the economy is expanding and suffer when the economy is contracting. The effects are likely to be just the opposite for the out-party. Thus, the business cycle variable takes the value 1 for in-party incumbents during expansions, and -1 for in-party incumbents during contractions. The variable takes the

value 1 for out-party incumbents during contractions, and -1 for out-party incumbents during expansions. The variable takes the value 0 for all third-party incumbents.

4.2. *Voluntary Termination of the Congressional Career*

Using the reelection models described above, a prediction of the probability of winning reelection was generated for each incumbent in each term of their congressional career. This prediction was used, alongside measures of individual attributes and electoral system institutions to model voluntary termination of the House career. At the end of a term, a House incumbent can opt to run for reelection, retire or seek another office. These competing risks are captured in a trichotomous dependent variable that takes the value 0 if an incumbent runs for reelection, 1 if the incumbent retires and 2 if the incumbent seeks another office. The risks of leaving office via retirement or moving up are modeled using the multinomial logit procedure.[51]

In modeling the risks of voluntary termination, it is important to account for duration dependency, i.e., the possibility that an individual's decision to stay, retire or seek another office is influenced by decisions made previously. Failing to account for duration dependency in a multinomial logit framework is akin to assuming that the hazard rate is flat with respect to time (Box-Steffensmeier & Jones 2004). Empirical researchers have employed several strategies to account for duration dependency in discrete-time processes, including the inclusion of dummy variables for each year in

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[51] The multinomial logit estimator assumes independence of irrelevant alternatives (IIA). All of the competing risks models reported below passed the specification tests proposed by Hausman & McFadden (1984) and Small & Hsiao (1985). Additionally, a multinomial probit procedure was performed on the pre-House career paths model to measure previous political experience. The results are nearly identical to those of the multinomial logit model.

office and transformations of duration values. The latter approach has the advantage of parsimony, using fewer degrees of freedom and simplifying the characterization of the baseline hazard rate. After considering a variety of alternative specifications, a natural log transformation of duration values was chosen.[52]

As with the reelection model, there was some attrition due to missing election returns. I was able to recover a measure of previous margin for 7,138 of 7,534 eligible incumbents. This variable is necessary for generating a prediction of the probability of winning. LOG(PROB WIN) takes the log transformation of this probability. Consistent with past research on congressional careers (Jones 1994; Kernell 2003), I expect this term to be negatively associated with retirement. With respect to moving up, it is possible that those whose reelection prospects are good will be less likely to go elsewhere – i.e., electoral danger does not compel exit via ambition. However, endangered incumbents are probably equally likely to lose races for other offices. Incumbents that are likely to win reelection are also best poised to take advantage of opportunities for advancement. Thus, I expect the probability of winning to have a mild positive effect on moving up.

In addition to the expected probability of winning, I include many of the same measures of previous political experience and electoral institutions that were used in the primary and general reelection models. I control for age, region, rotation (sophomore, sophomore-primary interaction), and ideology (party difference). Consistent with Kernell (2003) and others, I expect the onset of ballot and primary reforms to be

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[52] I compared linear, natural log, quadratic and cubic spline transformations against the null model and saturated model with dummies for each year in office (results not shown). Each of the transformations was superior to the null model. The saturated model did account for more variance, albeit at a cost of many degrees of freedom (tenure ranges from 1 to 26 terms in the dataset). The natural log transformation appears to fit the data better than other specifications. In any event, the substantive results do not change when other transformations are used.

negatively associated with retirement. These reforms gave members greater control over their political fates and most incumbents used this freedom to arrange longer stays in Washington. The effect of rotation is likely to be particularly pronounced for retirement, with those in their second term more likely to retire prior to implementation of the direct primary. Finally, I included a dummy variable, TOP 10 COMM, which denotes whether a member was serving on one of the 10 best House committees at the time of his reelection (Groseclose & Stewart 1998; Canon & Stewart 2002). Having a plum committee assignment increased the attractiveness of House service and likely reduced the probability of both retirement and ambition.

Including the four variables indicating the pre-House career enables me to assess whether the path to office independently influences the retirement decision. With respect to those in the amateur and legislator categories, there is reason to believe that the pre-House career will register an independent effect. Those in the amateur category reached the House at the beginning of their career, with few state or local ties. So, while their reelection prospects were likely to be dimmer, the opportunity costs of running for reelection were low. As such, I expect the amateur category to be negatively associated with retirement. I expect a similar relationship between the legislator category and retirement, but for a different reason. Long stints in legislative offices suggest a greater commitment to a legislative career. I expect that these effects on retirement will be especially pronounced after ballot reform. If these individuals were inclined to run for reelection before ballot reform, it stands to reason that they were doubly so once their electoral fates were firmly under their own control.

4.3. Results

     Table 7.5 contains the results of the three primary reelection models (one for each measure of previous political experience) described above. The dependent variable is a binary indicator of whether the incumbent was renominated or defeated. Table 7.6 contains the results of the three general reelection models. Here, the dependent variable is a binary indicator of whether the incumbent was reelected or defeated. Table 7.7 converts the coefficients in Tables 7.5 and 7.6 into first differences (King, Tomz & Wittenberg 2000; Tomz, Wittenberg & King 2003). The results mostly conform to the expectations stated above. Southern incumbents are more likely to be reelected. Ballot reform and favorable economic conditions (or unfavorable conditions for opponents) are also associated with greater electoral success. Previous margin has a large impact on individuals' general reelection prospects. Changing this term from eight to 37 percent, from a narrow to comfortable victory, increases the probability of reelection by .13.

Table 7.5. Three Models of Primary Reelection

	I			II			III		
	β	t	Sig.	β	t	Sig.	β	t	Sig.
Log(Duration)	.223	1.49		.241	1.62		.221	1.49	
Held Previous Office	-.061	0.28							
Ballot * Prev. Office	-.182	0.68							
Yrs. Public Service				-.016	0.93				
Ballot * Yrs. Public Service				.017	0.86				
Amateur							.133	0.53	
Ballot * Amateur							-.190	0.62	
Local Careerist							-.418	1.46	
Ballot * Local Careerist							-.078	0.21	
Ballot	.632	2.54	**	.430	1.77	*	.620	2.25	**
Primary	-.186	0.98		-.172	0.91		-.166	0.88	
Age	-.019	2.67	***	-.019	2.70	***	-.020	284	***
Freshman	.987	3.09	***	.996	3.12	***	.976	3.06	***
Ballot * Freshman	-.925	2.92	***	-.912	2.87	***	-.921	2.90	***
Sophomore	-.269	1.17		-.270	1.18		-.277	1.21	
Primary * Sophomore	-.186	1.12		.388	1.18		.365	1.11	
At Large	-1.025	3.05	***	-1.046	3.12	***	-.967	2.86	***
Spec. Elect.	-.984	2.00	**	-1.020	2.08	**	-1.003	2.04	**
Faction	.154	0.21		.144	0.20		.204	0.28	
Margin	-.001	0.58		-.001	0.55		-.001	0.51	
South	-.161	0.88		-.170	0.92		-.127	0.69	
Party Dif.	.091	0.16		.067	0.12		.054	0.10	
Constant	3.672	8.35	***	3.766	8.60	***	3.707	7.90	***
Log-Likelihood	-1049.50			-1050.22			-1046.35		
AIC	2133.00			2134.45			2130.70		
N	6074			6074			6074		

NOTE: Numbers are logit coefficients. * $p < .10$, ** $p < .05$, *** $p < .01$

Table 7.6. Three Models of General Reelection

	I			II			III		
	β	t	Sig.	β	t	Sig.	β	t	Sig.
Log(Duration)	.260	2.83	***	.265	2.89	***	.259	2.81	***
Held Previous Office	.085	0.70							
Ballot * Prev. Office	-.019	0.12							
Yrs. Public Service				.043	3.58	***			
Ballot * Yrs. Public Service				-.039	2.91	***			
Amateur							-.292	1.97	**
Ballot * Amateur							.364	1.97	**
Legislator							-.211	1.06	
Ballot * Legislator							.451	1.61	*
Ballot	.433	3.00	***	.637	4.44	***	.146	0.84	
Pres. Elect.	-.253	3.17	***	-.260	3.26	***	-.254	3.18	***
Bus. Cycle	.071	1.80	*	.075	1.88	*	.073	1.83	*
Age	-.007	1.81	*	-.010	2.38	**	-.007	1.77	*
Freshman	-.116	0.80		-.117	0.80		-.117	0.80	
Ballot * Freshman	-.077	0.47		-.090	0.54		-.078	0.47	
At Large	-.464	1.73	*	-.468	1.74	*	-.498	1.84	*
Spec. Elect.	.295	0.64		.274	0.60		.311	0.67	
Faction	-.440	1.13		-.425	1.09		-.434	1.11	
Margin	.053	13.88	***	.052	13.83	***	.052	13.85	***
South	.292	2.24	**	.308	2.36	**	.308	2.35	**
Party Dif.	-.954	3.16	***	-.875	2.88	***	-.922	3.05	***
Constant	1.048	4.31	***	.979	4.03	***	1.292	4.82	***
Log-Likelihood		-2046.70			-2040.25			-2044.34	
AIC		4125.41			4112.51			4124.69	
N		5814			5814			5814	

NOTE: Numbers are logit coefficients. * p < .10, ** p < .05, *** p < .01

Table 7.7. Changes in the Probability of Reelection

Changing this variable ...	from ...	to ...	PRIMARY WIN			GENERAL WIN		
			changes prob. of ... by...	*Lower Bound*	*Upper bound*	*changes prob. of ... by...*	*Lower Bound*	*Upper bound*
Duration[a]	1	4	.007	-.002	.026	**.059**	.018	.106
Amateur	No	Yes	.002	-.013	.015	**-.052**	-.091	-.012
Ballot * Amateur	No	Yes	.023	-.000	.051	.035	-.015	.089
Legislator	No	Yes	-.017	-.062	.002	-.036	-.104	.030
Ballot * Legislator	No	Yes	.003	-.028	.028	.057	-.010	.123
Ballot	No	Yes	**.021**	.003	.038	.025	-.027	.084
Primary	No	Yes	-.004	-.017	.006			
Age[a]	43	57	-.008	-.017	-.002	<u>-.018</u>	-.036	.001
Freshman	No	Yes	**.017**	.005	.036	-.018	-.072	.029
Ballot * Freshman	No	Yes	.022	-.002	.044	-.007	-.073	.060
Sophomore	No	Yes	-.009	-.027	.004			
Primary * Sophomore	No	Yes	-.002	-.021	.014			
Pres. Elect.	No	Yes				**-.043**	-.073	-.016
Bus. Cycle[b]	Cont.	Exp.				<u>.025</u>	-.000	.052
Margin[a]	8	37	-.001	-.006	.003	**.137**	.104	.176
At Large	No	Yes	**-.046**	-.113	-.008	**-.096**	-.213	-.002
Spec. Elect.	No	Yes	-.050	-.151	.000	.034	-.123	.135
Faction	No	Yes	-.002	-.068	.027	-.086	-.277	.050
South	No	Yes	-.003	-.017	.006	**.046**	.008	.082
Party Dif.[a]	.042	.166	.000	-.003	.004	**-.018**	-.032	-.006

NOTE: Probabilities are generated from Tables 7.5 and 7.6. The baseline probability of reelection, i.e., when ballot is set to "No," margin is set at "five percent" and all other variables are set to their medians is .94 for the primary and .79 for the general. These baseline probabilities apply to members of the omitted career path categories. Boldface indicates differences are significant at the .05 level; underline at the .10 level. Upper and lower bounds denote boundaries of the critical interval for each estimate.
[a] These values correspond to the 25th and 75th percentiles.
[b] Cont. indicates contraction, Exp. indicates expansion with respect to the business cycle.

Tables 7.5 and 7.6 facilitate a comparison of the three alternative measures of previous political experience. None of the three measures of experience are particularly helpful in explaining renomination. The effects of experience are larger in the general reelection model. In the first column of Table 7.6, the coefficient for previous elective office is positive, but not statistically significant. The coefficient for years in public service is positive and statistically significant. This effect diminishes after ballot reform, as indicated by the positive interaction coefficient. In the third column, the variables indicating the pre-House career path are correctly signed and, with one exception, statistically significant. In particular, those who reach the House via the amateur path are less successful in winning reelection. Moving from the omitted to the amateur category reduces the probability of winning by .05. The Akaike information criterion (AIC), which provides a comparable measure of fit, is inconclusive. Model three best explains primary success while model two better accounts for general election success.[53] This suggests that there is no significant penalty for incorporating more detailed knowledge of previous experience.

The results of the three competing risks models of voluntary retirement, summarized in Table 7.8, are also mostly consistent with the predictions stated above. (The results for voluntary moves to other offices are provided in the Appendix.) Most important, previous political experience appears to influence retirement independently of its effects on reelection. The coefficient for the amateur category is negative and

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[53] The AIC facilitates comparative assessments of the fit of non-nested models. The AIC is computed by the following formula: AIC = -2 (log-likelihood) + 2 (c + p + 1), where c is the number of covariates, and p is the number of structural parameters. The AIC rewards parsimonious models by penalizing the log-likelihood when additional parameters are added to a model. All else equal, models with lower AIC values are preferable (see Box-Steffensmeier & Jones 2004, pp. 43-45 for a more detailed discussion).

significant at the .05 level. Similarly, those in the legislator category are less likely to leave the House voluntarily. In both cases, the relationship becomes more pronounced following ballot reform. The pre-House career path measure of previous experience seems superior to the other two measures. The third model also outperforms the other two in accounting for variation in voluntary termination, registering the lowest AIC value. Table 7.9 converts the multinomial logit coefficients to first differences. With margin set at five percent and all other variables set to their medians, those in the amateur category are less likely to retire – the probability decreases by .03 before ballot reform and by .11 afterward. These probabilities, while small in absolute terms, are sizeable with respect to the baseline hazard rate and impressive given that they persist even after the indirect effects of experience (i.e., their impact on reelection) have been accounted for.

Table 7.9 also includes first differences for ballot and primary reforms, the two most important changes in electoral system institutions during this period. As expected, the hazard rate is lower after ballot reform and lower still following implementation of the direct primary. Ballot reform effectively reduces the probability of retirement by .11. Primary reform reduces the probability of retirement by .10 while increasing the probability of moving to another office by .01. With the exception of rotation, which affected a limited number of members at a single point in the House career, these are the largest effects in the model. As expected, members representing Southern districts and those assigned to a top 10 committee were less likely to retire. Those whose ideal points placed them far to the right or left of their respective party's median member were significantly more likely to retire.

Table 7.8. Three Models of Retirement

	I			II			III		
	β	t	Sig.	β	t	Sig.	β	t	Sig.
Log(Duration)	.220	3.01	***	.234	3.19	***	.208	2.85	***
Held Previous Office	.094	0.95							
Ballot * Prev. Office	.024	0.15							
Yrs. Public Service				.020	2.35	**			
Ballot * Yrs. Public Service				-.017	1.57				
Amateur							-.219	1.93	*
Ballot * Amateur							.178	1.04	
Legislator							-.448	2.81	***
Ballot * Legislator							.343	1.28	
Ballot	-.713	5.29	***	-.592	4.52	***	-.873	5.89	***
Primary	-.771	5.80	***	-.784	5.88	***	-.780	5.84	***
Log(Prob. Win.)	-1.557	3.54	***	-1.676	4.01	***	-1.511	3.49	***
Margin	-.001	0.70		-.001	0.62		-.002	0.82	
Age	.014	3.37	***	.013	2.95	***	.015	3.58	***
Sophomore	.691	7.52	***	.692	7.52	***	.698	7.58	***
Primary * Sophomore	-.600	2.37	**	-.605	2.38	**	-.613	2.42	**
South	-.229	2.12	**	-.221	2.04	**	-.204	1.88	*
Top 10 Comm.	-.250	3.10	***	-.254	3.14	***	-.250	3.09	***
Party Dif.	1.119	3.89	***	1.126	3.95	***	1.144	3.98	***
Constant	-2.766	10.91	***	-2.813	11.21	***	-2.536	9.90	***
Log-Likelihood	-3190.95			-3189.26			-3184.55		
AIC	6409.91			6406.52			6401.11		
N	7138			7138			7138		

NOTE: Numbers are multi-nomial logit coefficients.

* p < .10, ** p < .05, *** p < .01

Table 7.9. Changes in the Probability of Retiring, Moving Up

Changing this variable ...	from	to ...	RETIRING changes prob. of ... by	Lower Bound	Upper bound	MOVING UP changes prob. of ... by	Lower Bound	Upper bound
Duration[a]	1	4	**.046**	.011	.078	**.010**	.002	.020
Amateur	No	Yes	**-.034**	-.069	-.000	.000	-.014	.012
Ballot * Amateur	No	Yes	**-.117**	-.157	-.081	.000	-.013	.013
Legislator	No	Yes	**-.063**	-.107	-.016	-.010	-.025	.005
Ballot * Legislator	No	Yes	**-.123**	-.169	-.075	.014	-.003	.036
Ballot	No	Yes	**-.113**	-.155	-.075	-.001	-.017	.009
Primary	No	Yes	**-.105**	-.138	-.074	**.015**	.003	.038
Age[a]	43	57	**.039**	.018	.061	**-.008**	-.016	-.003
Sophomore	No	Yes	**.143**	.104	.184	<u>-.008</u>	-.019	.000
Primary * Sophomore	No	Yes	**-.094**	-.143	-.036	.013	-.003	.042
Prob. Win.[b]	.73	.90	**-.055**	-.083	-.026	.003	-.004	.014
Margin[a]	7	35	-.009	-.031	.012	-.001	-.006	.003
South	No	Yes	<u>-.031</u>	-.063	.000	-.000	-.008	.010
Top 10 Comm.	No	Yes	**-.040**	-.068	-.014	.004	-.002	.012
Party Dif.[a]	.043	.168	**.024**	.012	.038	-.000	-.003	.003

NOTE: The probabilities depicted here are generated from 7.8 and A1 in the appendix. The baseline probability of retiring, i.e., when ballot is set to "No," margin is set at "five percent" and all other variables are set to their medians is .22. The baseline probability of moving up is .02. These baseline probabilities apply to members of the omitted career path categories. Boldface indicates differences are significant at the .05 level; underline at the .10 level. Upper and lower bounds denote boundaries of the critical interval for each estimate.
[a] These values correspond to the 25th and 75th percentiles.

Finally, the expected probability of winning powerfully shapes the decisions of

House incumbents about whether to run for reelection, retire or seek another office.

Changing the probability of winning from .73 to .90 reduces the probability of retirement

by .05. Similarly, changing the probability of winning from .45 to .55 (from a narrow

defeat to narrow victory) reduces the hazard of retiring by seven percent. Changing the

probability from .45 to .55 (from a narrow to easy victory) reduces the hazard by 12

percent. Interestingly enough, expectations about the probability of winning appear to

have a negligible effect on moves to other offices. The coefficient is positive, but

substantively negligible and fails to reach conventional levels of statistical significance.

Perhaps this weak finding reflects the ambivalence of House incumbents described

above. Increasingly, House incumbents were well-poised to seek political opportunities

elsewhere. With the prestige of the office increasing substantially in the 20[th] century,

however, the inclination to do so was much less than ever before.

5. Conclusion

The sequence analysis techniques described in this paper represent a set of tools

for uncovering difficult-to-discern patterns in datasets where the unit of analysis is an

ordered array or sequence of events rather than an individual event or choice. Past

scholarship has generally modeled the political career as a collection of isolated events or

choices generated by a stochastic process. For standard statistical techniques, this

independence assumption is necessary. Nonetheless, it ignores potentially important

information about the sequence of events. Sequence analysis methods require no

assumptions about the data generating process. However, the analyst must make

important judgments in deciding how to weight various replacement and indel operations,

and in determining the number of clusters to focus on. Thus, like other statistical tools,

sequence analysis methods offer no substitute for detailed knowledge of the phenomenon of interest.

The sequence analysis methods described here enabled me to address an important question raised by past research on political careers – whether the behavior of politicians is influenced by how they got to where they are. Using optimal matching and cluster analysis, I was able to partition the pre-House career into a small number of discrete paths. These paths appear to exert a powerful influence on congressional tenure, both indirectly through their effect on reelection, and directly on personal decisions about whether to run for reelection, retire or seek another office. Using this novel measure of previous political experience, I demonstrated that congressional retirements are both strategic and contingent on electoral system institutions.

Sequence analysis methods can be readily extended to other political careers. The 3,041 Representatives analyzed in this paper are just a small subset of public officials in the U.S. federal system. These methods can also facilitate comparison of career trends across countries and over time. In Chapter 4, I examine differences among career sequences for other officeholders, including members of the U.S. cabinet, Senate, federal judiciary and those serving as governors in the 50 states and mayors in 15 big cities. Studying the careers of those occupying these very different offices will help further illuminate the impact of national political trends, appointment procedures, electoral system institutions, and internal organization on political ambition. In doing so, I hope to make more concrete the presumed link between how individual politicians reach public office, and political behavior and political institutions.

Political careers represent just one of many phenomena of interest to political scientists that involve sequences of events or choices. Past scholars, for instance, have focused on the path that nations take to modernization (Rostow 1960; Inglehart & Welzel 2005). Economic change, political development (Huntington 1968), revolution (Skocpol 1979) and the rise of nationalism (Deutsch 1961) are all outcomes that scholars have modeled as historical sequences. Contemporary public policy processes, including lawmaking and budgetary processes (Padgett 1980), can be modeled as decision-making sequences. In international relations, researchers have focused on the sequence of events that lead to ethnic conflict and war. Finally, political scientists have offered a variety of cyclical theories to explain critical elections (see Mayhew 2000), presidential leadership (Skowronek 1993) and the resurgence of racism (Woodward 1966). Given the importance of these subjects, the potential contribution that sequence analysis methods can make is substantial.

Note: The material in this chapter was co-authored by Samuel Kernell.

APPENDIX I

Table 7.A1. Three Models of Moving Up

	I			II			III		
	β	t	Sig.	β	t	Sig.	β	t	Sig.
Log(Duration)	.479	3.21	***	.461	3.09	***	.431	2.93	***
Held Previous Office	.002	0.01							
Ballot * Prev. Office	.175	0.48							
Yrs. Public Service				.020	0.78				
Ballot * Yrs. Public Service				-.013	0.49				
Amateur							-.021	0.06	
Ballot * Amateur							.173	0.43	
Legislator							-.999	1.54	
Ballot * Legislator							1.67	2.40	**
Ballot	.062	0.20		.200	0.63		-.235	0.66	
Primary	.433	1.89	*	.423	1.84	*	.472	2.04	**
Log(Prob. Win.)	-.156	0.15		.178	0.17		.491	0.45	
Margin	-.001	0.30		-.002	0.54		-.002	0.67	
Age	-.031	3.38	***	-.032	3.29	***	-.028	3.09	***
Sophomore	-.442	1.27		-.445	1.28		-.437	1.26	
Primary * Sophomore	.366	0.81		.350	0.77		.349	0.77	
South	-.070	0.30		-.068	0.30		-.084	0.37	
Top 10 Comm.	.161	1.00		.155	0.96		.154	0.95	
Party Dif.	-.031	0.04		.052	0.07		.148	0.21	
Constant	-2.779	5.08	***	-2.749	4.99	***	-2.558	4.52	***
Log-Likelihood	-3190.95			-3189.26			-3184.55		
AIC	6409.91			6406.52			6401.11		
N	7138			7138			7138		

NOTE: Numbers are multi-nomial logit coefficients.

* $p < .10$, ** $p < .05$, *** $p < .01$

Chapter 8

Sequence Analysis and Career Studies:
A Review and Prospectus

In this dissertation, I set out to learn more about who serves in public office and how they got to be there. This is by no means a new question; researchers have compiled detailed information on the background and experiences of politicians. In democracies, control of government is delegated to a few individuals who make decisions on behalf of the rest. Using detailed descriptive information, researchers can assess whether those in government represent, descriptively and substantively, those for whom they speak. The Framers believed that institutions could be designed to increase the likelihood of recruiting men of ability to serve in government. Madison argued that in a large republic with free and fair elections, men of established character and credentials would be selected to serve. Selection of more qualified candidates for public office would result in better decision-making.

Implicit in Madison's analysis was the notion that who politicians are and how they reach office will influence what they do. Unfortunately, several decades of empirical research have failed to conclusively link differences in the path to office to the choices politicians make (Matthews 1984). Researchers have learned a great deal about who serves in public office, but it is unclear whether differences in background or experience make any difference. In this dissertation, I argue that these differences matter. Empirically demonstrating this, however, requires more comprehensive career data, and methods appropriate for handling such data. New data are needed because existing

resources do not allow researchers to recover the sequence of offices held by politicians before they reach offices like the U.S. House or federal judiciary. New methods are needed because traditional measures of experience fail to capture the salient differences among career sequences.

1. What I Did

To address the first problem problem, I collected complete career sequences for 5,983 politicians who held the office of U.S. cabinet member, senator, representative, federal judge, state governor or big city mayor between 1809 and 1944. Career data were obtained from biographical directories for each office. For each individual, all stints in public service were recorded, coded and then assembled as strings or sequences of office-holding events. Unfortunately, the costs of collecting career sequences for *all* individuals holding these six offices were prohibitive. In lieu of compiling a complete census, I identified five historical eras between 1809 and 1944 and collected detailed information on every individual who served in these offices during those eras. Though the time series for these offices remains incomplete, the data used in this dissertation constitute the most detailed source of information on previous political experiences assembled to date.

In addition to tapping new sources of data, I used sequence analysis methods that, with few exceptions, have not been used to study political phenomena. The optimal matching algorithm used to calculate distances for each pair of observations was developed by molecular biologists interested in comparing protein and DNA sequences. Their application to the study of social phenomena is due largely to the work of Andrew Abbott and his collaborators. I used optimal matching to calculate a distance measure

that summarizes differences in the number, type and order of offices occupied. I then used cluster analysis procedures to group similar sequences together and analyze the matrix of distances produced by the algorithm. Finally, these groups of sequences were used as independent and dependent variables in statistical analyses.

2. Why I Did It

The primary purpose of collecting more detailed career data was to address the "major gap" identified by Matthews (1954). That is, I wanted to examine career patterns among individuals holding different, but important public offices in the U.S. Schlesinger (1966) and others had made significant inroads, but subsequent research largely abandoned the search for patterns among political careers. The studies that do exist give a static portrayal of career paths. I was interested not only in what the main pathways to power were, but whether they had changed over time. The sampling scheme that I used resulted in five cohorts of individuals for each office – 30 cohorts in all. Since each cohort included all individuals starting in an office during a particular era, the scheme allowed me to characterize in great detail the political career at five points in U.S. history. Similarly, by collecting data on individuals holding different offices, it was possible to compare career paths within and across offices over time.

To make sense of these complex sequences of office-holding events, new methods and procedures were necessary. The sequence analysis methods described here capably perform tasks that traditional statistical techniques, like event history analysis, do poorly. Most important, they provide a way of classifying complex career sequences into meaningful career paths. Event history techniques do not identify career paths and most

researchers that use them have ignored the pattern question. The optimal matching algorithm allows the researcher to uncover regularities in data that examination by the naked eye or via simple frequency tables typically fail to notice. It does so without resort to debilitating assumptions about the data generating process.

Over the last 20 years, career studies have moved away from aggregate-level analyses in favor of individual-level models of career decision-making. These models proceed *as if* career sequences were artifacts of the individual choice process. Indeed, under these models, the number, type and order of offices occupied are treated as by-products of a first-order Markov process. Markovian models make three critical assumptions about political mobility. The first assumption, homogeneity, posits that causal processes work the same for all individuals residing in a particular office, e.g., all House members. The second assumption, path independence, argues that an individual's position in the current period is completely determined by the position held in the previous period and the transition probability matrix – a full listing of the baseline probabilities of moving between offices. The third assumption, stationarity, requires that these transition probabilities remain constant over time.

In Chapter 1, I argued that these assumptions are unrealistic with respect to political careers. One problem stems from the independence assumption. As Jones (1994) demonstrates, the choices made by individuals over time are correlated. Models that fail to account for duration dependency are mis-specified and will yield poor estimates of causal relationships. Another source of unreality is the Markovian description of the sequence generating process. What we do know about career paths suggests a winnowing of ambition over time, where earlier choices circumscribe later

ones. Finally, stationarity assumes away one of the more interesting empirical questions in career studies. Evidence suggests that the transition probability matrix, which summarizes the pairwise propensities of moving between offices, has changed considerably over the course of history (Kernell 1981). By assuming that choices depend only on the state previously occupied and a static probability matrix, the Markovian model stipulates up front that previous political experience does not matter.

Aside from these deficiencies, there are several affirmative reasons for paying attention to the sequential information contained in career data. Perhaps the most compelling reason is to improve understanding of the systematic component of career decision-making. The data generating process that produces career sequences need not be Markovian for it to be stochastic. In lieu of representing career sequences as memory-less phenomena, researchers can incorporate the information contained in early decisions to explain choices made later on. In order to do so, however, the researcher must find some means of organizing sequential information into categories that will be useful for traditional statistical analysis. The optimal matching, multi-dimensional scaling and cluster analysis procedures used in sequence analysis are well-adapted to this task. In this sense, sequence analysis methods are best viewed as a complement rather than alternative to maximum likelihood, event history and other methods typically used by political scientists.

3. What I Found

Implementing sequence analysis methods is not always straightforward, as the descriptive material and examples in Chapter 3 can attest. Given the data collection

demands they impose, the theoretical challenges involved in specifying the matrix of substitution costs, and the computational intensiveness of the optimal matching, scaling and clustering algorithms, it is worth asking why anyone would go to the trouble of using sequence analysis methods. One answer has to do with the nature of the question being considered. Theory and common sense offer reason to expect that political careers and behavior will be linked. If one has to classify political careers to probe this relationship, then it is best to use methods that are well-suited for the task. Using these methods does require the researcher to make choices about how office-holding events differ, and what clustering algorithms and stopping rules to adopt. The efficacy of these choices, the data collection demands and computing costs of implementing the procedures must be weighed against the results they produce.

The following is a brief summary of the findings reached in Chapters 4, 5, 6 and 7. With respect to each of these findings, both new data and new methods were instrumental. In addition to demonstrating a new approach to political career studies, these findings constitute this dissertation's main contribution to closing the gap between theoretical assertion and empirical reality. While preliminary in many respects, these findings, I am confident, more than justify the additional costs of data collection and statistical sophistication.

- *Political careerism was pervasive in the U.S. during the late 19th and early 20th centuries*. Whereas past work has focused intently on tenure patterns within the U.S. House and Senate, this dissertation demonstrated that rising careerism was pervasive in the U.S. between the Civil War and World War II. It extended to

multiple offices, from executive positions with fixed terms to appointed positions with unlimited terms. It affected all three branches of the national government and was felt at the pinnacles of state and local government. In terms of existing scholarship, these trends require researchers to look beyond traditional office-based explanations for rising careerism.

- *Lengthening terms of service were part of a broader professionalization of the political career.* In contrast to previous work, which cites internal changes, i.e., institutionalization, as the primary cause of rising careerism, this dissertation found that careerism within particular offices was part of a broader trend toward professionalization of the political career. In particular, the late 19th and early 20th centuries witnessed the emergence of the professional politician as the dominant figure in public life. Moreover, while longer tenure in the six destination offices studied here contributed, I found that individuals were increasingly acquiring "professional" status prior to entering these institutions. For these individuals, no additional inducements or socialization was needed to encourage a long career in politics.

- *Specialization of the pre-destination career was a prominent feature of professionalization in the late 19th and early 20th centuries.* The emergence of professional politicians in the late 19th century coincided with the evolution of distinct paths to the six destination offices studied here. Despite longer pre-destination careers, the political experiences of individuals who reached these

offices were diverging from each other. That is, those ascending to the federal judiciary had more experiences in common than they had with politicians filling other offices. More elaborate and specialized career paths indicate a narrowing of political ambition. In contemplating moves to Congress or another office, politicians understood that certain office-holding experiences would be more valuable than others.

- *The thousands of pre-destination careers studied here can be partitioned into a small number of pathways to power.* Past work has come to different conclusions about whether there are few or many paths to high public offices. While it is true that no two career sequences are exactly alike, the office-holding experiences of individuals reaching the six destination offices studied here can be partitioned into a few discrete paths. For the pre-cabinet career, a four-group solution reasonably described the data. For big city mayors, there were six major pathways to city hall. For the U.S. House, which encompassed thousands of careers, an eight-group solution was sufficient. This is not to say that all other paths were unimportant or that there is not meaningful variation within the four, six or eight categories identified here. The basic point is that the paths to most high U.S. offices are orderly, not random.

- *The career paths to high office in the U.S. are characterized by substantial over-time variation.* The relative frequency of career paths has changed substantially over the course of history. For both big city mayors and members of the U.S.

House, the most important source of variation was the disappearance of amateurs during the late 19th and early 20th century. New pathways to city hall emerged in the 20th century. An increasing share of mayors emerged from prominent state and federal offices, as well as lengthy careers in the local legislature or civil service. For the House, the early 20th century saw a larger number of individuals emerging from local offices, especially law enforcement.

- *Political institutions appear to be a major factor shaping the pathways to power*. The incompleteness of the time series for most offices studied here dictate caution in making bold causal claims. Nonetheless, the patterns among pre-destination careers reflect the influence of political institutions. For both big city mayors and members of the U.S. House, over-time variation in the paths to office can be linked to institutional changes. For big city mayors, the length of the mayoral term and term limits were the institutions of note. Cities with longer terms of office and term limits saw fewer amateurs and more professionals reach office. For members of the U.S. House, the adoption of the secret ballot and implementation of direct primaries similarly resulted in fewer amateurs and legislative specialists and more law-and-order types.

- *Previous political experience helps explain mayoral and congressional reelection*. In contrast to past work, which has failed to link previous political experience to behavior in office, I demonstrated that the path followed to city hall and the U.S. House influences incumbent reelection. For big city mayors, career paths had

some of the largest effects on reelection in the model. For House members, the effects of previous political experience were less dramatic, though comparable in size to the effects of House tenure. In particular, those who reached the House with negligible political resumes had the most difficulty retaining their seats.

- *Previous political experience helps explain mayoral and congressional tenure in office*. In addition to its effects on reelection, I find that the path followed to city hall and the U.S. House powerfully shapes the retirement decisions of incumbents. For big city mayors, the effects were not dramatic, but nonetheless, indicate substantial variation in the level of both static and progressive ambition. For House members, the effects of previous political experience were sizable. Both amateurs and legislative specialists were less likely to retire voluntarily. I also found that career paths and institutions interact. The effects of previous political experience on retirement more than doubled following ballot reform.

- *Career paths provide a better measure of previous political experience than simple counts of years of public service or indicators of previous elective office*. For both big city mayors and members of the U.S. House, I compared the career paths measure of previous political experience against two alternatives. In both cases, the former proved to be superior in accounting for variation in reelection and voluntary termination of the destination career. In several instances, the alternative measures of experience were not significantly related to the choices incumbents made. This suggests that one possible explanation for the failure to

link previous political experience with behavior in office is the inability to systematically measure experience.

4. What Comes Next

The results reached in this dissertation constitute a useful start to better understanding sequential events more generally and career sequences in particular. The most obvious extension consists of filling in the time series for the six destination offices studied here. The main disadvantage of the sampling scheme that I used is that it does not allow the researcher to precisely measure the causes of career patterns. This is especially true with respect to political institutions. One of the more interesting findings in Chapters 5 and 7 was the indirect effects of political institutions on career paths. In addition to directly affecting what politicians do while in office, changes in electoral system institutions make some paths more likely while downgrading others. To properly assess the impact of institutions, it is necessary to collect career sequences before and after institutions change (or, alternatively, across institutional settings). Because the effects of institutional changes work their way through the political system over time, long pre- and post-intervals are desirable.

A second area for future research is the effects of career paths on other political behaviors. In this dissertation, I demonstrated the impact of previous political experience on the reelection prospects and retirement choices of big city mayors and members of the U.S. House. For big city mayors, governors and other executive officials, it would be useful to assess the relationship between experience and performance. Do incumbents with more substantial political resumes deal with crises more effectively? Are they more

or less likely to engage in political corruption? For members of Congress, are legislative specialists more effective at getting bills passed or in ascending to committee and party leadership posts? Does experience influence roll-call voting? For judges, does previous law enforcement experience influence rulings on criminal or civil liberties cases? Research in each of these areas can benefit from more detailed measures of previous political experience.

Perhaps the most promising course for researchers to pursue consists of applying sequence analysis methods to political careers in other countries. Comparative research on political career patterns offers a wider variety of electoral system institutions, party systems and socio-economic settings to consider. Do federal systems yield distinct career paths? How do legislative careers differ across presidential, semi-presidential and parliamentary regimes? Are career paths more important in shaping behavior in some countries as opposed to others? How have career tracks developed in emerging democracies? With few exceptions (e.g., Samuels 2003), little attention has been paid to the effects of regime structure on career patterns (Patzelt 1999). The methods and approach described here provide a common measure of experience that can facilitate comparative analysis.

On the methodological front, one area of future research is to focus more intently on subsequences. In this dissertation, I focused on the global differences among whole sequences, or the sequence of events leading to particular destination offices. Researchers studying other types of careers have represented careers in terms of trajectories and turning points. McFarland (2006), for example, used Markov models and network analysis to identify places where educational career paths intersect. He

discovered that certain courses constitute turning points in the educational career. Abbott & Barman (1997) have similarly observed that wildly different careers can, nonetheless, have subsequences in common. Two individuals might have similar sequences at the beginning of their careers, but diverge at a particular juncture. Alternatively, individuals might have different experiences until they reach a common office, but be similar thereafter. Are there turning points in political careers? The type of detailed career data collected here will allow researchers to investigate a much larger set of questions that past work has largely ignored.

Finally, political careers represent just one of many phenomena of interest to political scientists that involve sequences of events or choices. Past scholars, for instance, have focused on the path that nations take to modernization (Rostow 1960; Inglehart & Welzel 2005). Economic change, political development (Huntington 1968), revolution (Skocpol 1979) and the rise of nationalism (Deutsch 1961) are all outcomes that scholars have modeled as historical sequences. Contemporary public policy processes, including lawmaking and budgetary processes (Padgett 1980), can be modeled as decision-making sequences. In international relations, researchers have focused on the sequence of events that lead to ethnic conflict and war. Finally, political scientists have offered a variety of cyclical theories to explain critical elections (see Mayhew 2000), presidential leadership (Skowronek 1993) and the resurgence of racism (Woodward 1966). Given the importance of these subjects, the potential contribution that sequence analysis methods can make is substantial.

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