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Special *PAR* Symposium on Election Administration

The Public Administration of Elections

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The performance of election systems in the United States depends heavily on complex networks of people, tasks, organizations, and relationships, as well as the voting technology that has received so much attention since the presidential election of 2000. Public administration has much to contribute to our understanding of these systems. This article provides an overview of the field, highlighting linkages to theoretical approaches in public administration and emphasizing the importance of management in a brief case study.

> *Public administration has not devoted attention to election administration with anything like the priority it has given to other areas of public policy. . . . The agenda is there to be engaged and, if furthering democratic governance is the hallmark of the field, it would behoove us to engage it.*
>
> *—Charles Wise, 2001*

With a few recent exceptions, Charles Wise's call for public administration scholars to focus on the conduct of elections has gone unheeded. One reason may be unfamiliarity with the seemingly arcane structures and procedures of the field and uncertainty over how the knowledge of public administration might apply. This paper provides an overview and introduction to the field by

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- Describing the major tasks of election administration and summarizing relevant research on them
- Showing that the system is actually a complex network of many different actors and types of relationships, and that different theories may be appropriate for understanding different parts of it
- Arguing that such systems have a propensity for "normal accidents" (Perrow 1999) and have difficulty adjusting to rapid change
- Illustrating the importance of leadership and management in the system

This paper is organized into four sections. First is a brief summary of organizational structures and formal relationships. The second section describes the basic tasks of election administration and covers organizational relationships, changes, and relevant theoretical perspectives. The third section is a mini–case study of a local innovation in election administration, election day vote centers, which illustrates the ways in which parts of the system interact and the importance of managerial decisions. The fourth section concludes the paper with a summary of the basic argument concerning system complexity and a discussion of its implications.

Structure

Unlike the majority of democracies, in which central governments manage elections (Massicotte, Blais, and Yoshinaka 2004, 83–101), the United States has separate state election systems operating under an umbrella of federal policies. At the federal level, the Help America Vote Act of 2002 (HAVA) created the U.S. Election Assistance Commission (EAC) but denied it rulemaking authority except in one limited area. Nevertheless, the EAC is playing an increasingly important role in such areas as setting voluntary standards for voting equipment (described below) and providing valuable information to election officials and policy makers (Montjoy and Chapin 2005). Reports on administrative practices and poll worker recruiting and training, for example, are now available online at www.eac.gov and accessible to even the smallest election jurisdictions.

The states, not the federal government, are the primary architects of election law, and local jurisdictions (counties, cities, and townships) are primarily responsible for administration. Each state now has a chief election officer (CEO), who is typically an elected

official, usually the secretary of state. Most CEOs now have rulemaking authority, but they typically do not employ or fund local election officials (LEOs), most of whom are, themselves, elected (Kimball and Kropf 2006). Besides being decentralized vertically, the system is fragmented horizontally, as Kathleen Hale and Christa Daryl Slaton discuss elsewhere in this symposium. Federal and state laws prescribe roles for numerous other actors, from the U.S. Department of Defense to local sheriffs in some cases.

Decentralization and fragmentation affect the uniformity of administration and the capacity of systems to implement top-down mandates, but they reflect longstanding preferences for local control and fears of concentrated power. The debate over the appropriate concentration of power is at least as old as the study of public administration. Woodrow Wilson's famous argument—"There is no danger in power if only it be not irresponsible" (1887, 213)—assumes a system of hierarchical control leading up to elected officials who can be made responsible to the public through fair and effective elections. Here we can see the special role of election administrators: They are both agents and managers of the ultimate accountability mechanism. As Jones argued, "Complete trust cannot be extended to any single authority to run an honest election because every candidate for such trust may have a vested interest and may end up abusing that trust" (2004, 46).

The system is changing because HAVA pushes centralization at the state level (Montjoy 2005). Historically, state legislatures were hesitant to trust any state office with significant discretionary power over elections, preferring instead to provide direction and coordination to local officials through detailed statutes rather than administrative regulation and oversight (Harris 1934). That system became impractical as new technologies and federal policies greatly increased the complexity of elections. HAVA promises to complete the shift to major administrative roles for CEOs.

In summary, the organizational structure for elections is undergoing changes in the form of the new federal Election Assistance Commission and the recently empowered state CEOs. These significant and ongoing developments in intergovernmental relations merit further research. The formal structure of administration has not changed as much at the local level, but the tasks that LEOs perform are undergoing significant change. That is the subject to which we now turn.

Tasks

James Q. Wilson (1989) argued that in order to understand organizations, one must examine their critical tasks. This section follows that approach. Figure 1 displays a diagram of the major components of election administration. These functions are common to all election systems in the United States except for North Dakota and some rural jurisdictions in Wisconsin, which do not require voter registration, and Oregon, which conducts all elections by mail. The figure is divided into three panels to represent activities before, during, and after an election day.

The activities in the first panel may stretch back for years or only a few weeks as election officials register voters and maintain voter files; prepare ballots; acquire, maintain, and deploy voting equipment; find and prepare polling places; and recruit and train poll officials. All of these activities flow into the actual voting at polling places on election day. A parallel set of activities, labeled "alternative voting," covers votes cast under programs such as absentee and early voting. Votes from the polling places and alternative voting flow into the counting process, which begins on election day but may continue for several more days.

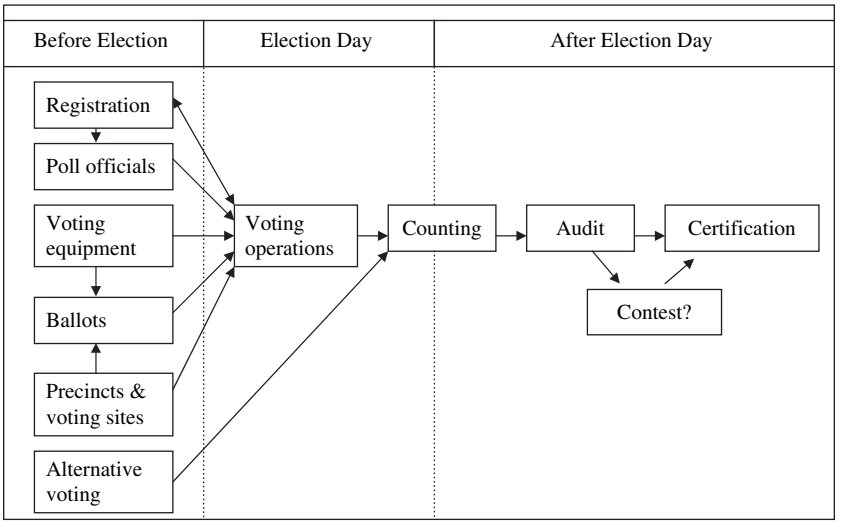

Figure 1 Major Tasks of Election Administration at the Local Level

The audit function covers a number of activities, which vary by state, from a check for the receipt of all materials from polling places to recount and challenge procedures. The final step is the certification of winners.

The tasks are intermittent. Even voter registration, the only function that goes on year-round, experiences a surge of activity near an election. On election day itself, the involvement of so many people in a short period of time places a premium on preparation and makes error detection and correction difficult. Continuous operations, such as those of the Social Security Administration, are not good analogies. Space missions and mass evacuations make better comparisons.

Registration

The tasks of creating and maintaining accurate lists of registered voters are basically linear. Multiple public and nonprofit organizations accept applications and transmit them to local registrars, who check for accuracy, eligibility of the applicants, and redundancy. Files of registered voters have to be maintained to remove the names of people who have died, moved away, or otherwise become ineligible. In traditional systems, a separate list of registered voters is prepared for each polling place. Information obtained from voters at the polling places may be used to update the master file—hence the two-headed arrow in figure 1.

Amendments to the Voting Rights Act of 1965 . . . affect registration and other tasks by requiring jurisdictions with significant language minorities to provide forms and information in the minority language and to provide language assistance at polling places.

The United States is among a minority of nations that require prospective voters to take the initiative in the registration process (Massicotte, Blais, and Yoshinaka 2004, 67). There is an extensive literature on the effects of different registration requirements and procedures (e.g., Avery and Peffley 2005; Rosenstone and Wolfinger 1978). Most studies assume uniform implementation of the laws (see Highton and Wolfinger 1998 for an exception). It seems clear that registration policy has effects on the size and composition of the electorate, although there is disagreement about their magnitude.

On the other hand, surveys of election officials conducted by the U.S. Government Accountability Office (GAO, formerly the General Accounting Office) following the 2000 and 2004 presidential elections found variance in implementation, even within the same jurisdiction, and continuing challenges that affect the registration process (GAO 2001, 2006). A major source of concern was the National Voter Registration Act of 2003 (NVRA), which opened new opportunities for prospective voters to apply for registration but created headaches for registration officials and for some would-be voters. Driver's licensing agencies, typically called departments of motor vehicles (DMVs), and other agencies must accept applications and transmit them to registration offices. Survey respondents reported problems including missing or illegible information, applications arriving after the registration deadline, and applications not arriving at all. The first two problems compound another: a flood of applications near the deadline for major elections. Processing them, especially trying to contact applicants to obtain missing information, is a time-consuming process that stretches the capacity of election offices.

That there are problems should not surprise students of administration. The NVRA and predecessor programs in some of the states took a key step in the registration process out of the hierarchical control of election officials and assigned it to agencies with no experience in elections or mission to support the electoral process. Such "tack-on" mandates often meet resistance (Montjoy and O'Toole 1979). (It is interesting to note that the first motor-voter program did not experience this problem because the Michigan secretary of state, who pioneered the concept, had authority over the state DMV as well.)

Amendments to the Voting Rights Act of 1965 (VRA) affect registration and other tasks by requiring jurisdictions with significant language minorities to provide forms and information in the minority language and to provide language assistance at polling places. Using case studies, Hall (2004) examined ways in which election officials can expand services to language minorities through cooperation with nonprofit organizations. In order to test the effects of the language protection policy as it is actually implemented, Jones-Correa and Waismel-Manor (2007) sent students to a sample of covered jurisdictions, finding substantial variation in compliance and a positive effect on turnout when the policy was fully implemented.

HAVA is having a profound impact on the registration function, primarily through the requirement that states create and maintain central databases of all registered voters. Implementation requires not only appropriate technology but also new forms of interaction between CEOs and LEOs. A survey conducted by Electionline.org (2006b) found significant variation in procedures among the states—for example, whether purges are done by the state, the localities, or both.

HAVA mandated yet another network by requiring the CEO to enter into an agreement with the state DMV and the U.S. Social Security Administration to share information. Mandated networks at both the state and local levels require new skills in nonhierarchical management (Agranoff 2007).

Poll Officials

The people who staff polling places on election day, the face of the election system for most voters, are street-level bureaucrats over whom election officials can exert little direct control (Alvarez and Hall 2006; Montjoy and Slaton 2002). The key relationships are between LEOs and poll workers and, later, between poll workers and voters. A GAO survey found that a majority of election jurisdictions experienced problems recruiting and training sufficient poll workers (GAO 2001, 158–63). Problems included long hours, low pay, workday conflicts that limit the recruiting pool, and increasing technological demands for special skills. A subsequent survey found that fewer jurisdictions reported recruiting problems (a reduction from 51 percent to 36 percent), but the problems tended to be greatest in large and medium-sized jurisdictions, where most of the voters are (GAO 2006, 170–92).

The quality of training matters. Surveying poll workers in Ohio and Utah localities, Hall, Monson, and Patterson (2007) found that those who received more hands-on training in smaller groups expressed greater job satisfaction and confidence. Atkeson and Saunders (2007) found that experiences with poll workers had a significant relationship with voter confidence. The challenge for election officials, especially those in large urban areas, is to provide meaningful training to great numbers of poll workers at a time close enough to the election that the students will remember their lessons.

Federal and state requirements directly affect the recruiting and training of poll workers. The federal VRA requires covered jurisdictions to provide language assistance at polling places, and federal court rulings have required racial balancing of poll workers in some cases (e.g., *Harris v. Seigelman,* 695 F. Supp. 517, 528 [M.D. Ala. 1988]). State laws often stipulate how poll workers are to be selected (e.g., from recommendations by political parties or even by election) and outline special requirements (e.g., representation of opposing parties or being registered voters in the precincts where they serve) (Electionline.org 2007). Forty states impose requirements for poll worker training, while 27 (including seven that do not impose requirements) provide guidance or assistance (GAO 2006, 183). An LEO in New Jersey once told this author in 1976, "The state has great training requirements, and that gives me a choice—to obey the law or put on an election."

LEOs have undertaken a number of initiatives to address poll worker problems, including the use of student poll workers, the use of state and county employees, "adopt-a-poll" programs for businesses and community groups, and split shifts to reduce the long hours for poll workers (GAO 2001, 163). Additional evidence comes from an annual contest for best practices sponsored by the Election Center, a nonprofit organization of election officials. Of 32 entries from around the United States in 2007, exactly half of them focused on recruitment, training, or support of poll workers (Election Center 2007). Alvarez and Hall (2006) explored the application of principal–agent theory to the task of recruiting and training poll workers. Finding no effective means of increasing control, they recommended alternatives that eliminated or reduced reliance on poll workers, such as Oregon's all-mail elections or Colorado's voting centers, both LEO initiatives.

If control on election day is not likely, then the key variables are recruiting, managing (including retention), and training. The relationship between LEOs and poll workers does not exactly fit hierarchical or contractual models. Low pay, long hours, and the intermittent nature of the work mean that money is not likely to be a major inducement (Electionline.org 2007). Purposive and solidary incentives (Clark and Wilson 1961) may be more important, in which case the assumption of divergent interests between principals and agents may be questionable (Waterman and Meier 1998). The overall task of recruiting, training, evaluating, and retaining poll workers may benefit from the literature on volunteer management (Brooks 2002; Brudney 1990).

Voting Equipment

Providing voting equipment at polling places involves two basic tasks. First, the equipment is purchased from commercial vendors, usually according to standard government purchasing procedures, during which time LEOs interact with vendors and other county officials, such as the county commission, purchasing department, technology department, and attorneys. The second major task consists of preparing and deploying the equipment for each election, a task that may require continuing vendor support.

Problems revealed during the recount of Florida's 2000 presidential vote stimulated a great deal of research on voting technology (Ansolabehere and Stewart 2005; Brady et al. 2001; Bullock and Hood 2002; Caltech/MIT Voting Technology Project 2001; Herrnson et al. 2008; Knack and Kropf 2003; Saltman 2006; Tomz and Van Houweling 2003). The early research in this line influenced the Help America Vote Act of 2002, which includes incentives for jurisdictions using lever machines and punch cards to replace them. HAVA also requires that each polling place have at least one device that allows disabled voters, including the visually

impaired, to cast their votes without assistance. This requirement favored the adoption of direct-recording electronic (DRE) voting devices, or at least one DRE per polling place, because the equipment can include an audible system for the visually impaired. The language provisions of the VRA also favored DREs for covered jurisdictions because the equipment can be programmed for multiple languages.

More recently, advocates and scholars have questioned the security of DRE systems (Felderman, Halderman, and Felton 2006; Hite 2007). Moynihan (2004) applied Perrow's (1999) theory of normal accidents to the use of DREs and concluded that we must expect failures and take steps to minimize them. Such concerns have led to calls for voter-verifiable paper audit trails (VVPATs) or decertifying DREs. A survey conducted by Electionline.org (2006a) found that 22 states required local jurisdictions to use either VVPATs or paper ballots, including optical scan ballots. In 2007, California Secretary of State Debra Bowen decertified DREs already in use, causing affected LEOs to complain that they had to scramble to replace working equipment as a result of a decision in which they had no part (Wildermuth 2007). Donald Moynihan and Carol Silva report in this symposium that election officials tend to have confidence in their equipment.

A return to paper-based systems may seem circular. An essay in the 1911 edition of the *Encyclopedia Britannica* pointed to the high error rate in paper ballots as a major reason for shifting to mechanical voting devices (Chisholm 1911). And VVPATs may not result in an increase in accuracy. Experimental evidence indicates that most voters do not check the VVPAT ballots and that the difference in accuracy between a paper trail system and a system with no verification is slight (Herrnson et al. 2008, 111–36). There is, after all, no apparent reason to assume that most voters will be more conscientious in checking their printed ballots than they were in checking punch cards for dimples and hanging chad. Yet, VVPATs do provide both an opportunity for those who wish to check their ballots and a paper-based record of votes without stray marks that could be disputed in post-selection contests, as long as the printers work properly.

The lack of a purely technical solution highlights the importance of the interaction of people, processes, and technology, as the GAO has repeatedly pointed out (GAO 2001, 2006). Writing in this symposium, Michael Alvarez and Thad Hall stress the importance of strict chain-of-custody procedures for critical elements in the election process. The recent GAO review of undervotes in Sarasota, Florida, summarizes tests to ensure that the software used in electronic voting equipment was the same as that held in escrow by the Florida Division of Elections (Barkakati 2008).

Meanwhile, the Election Assistance Commission, its technical standards committee, and the National Institute of Standards and Technology are working on updating standards for voting equipment. The standards program, which predates HAVA, is voluntary, but a number of states now require compliance with the national standards, thereby making them mandatory for their local jurisdictions. Voting equipment manufacturers complain that this has become a de facto regulatory process in which they are not represented, contrary to at least the spirit of the Administrative Procedures Act and the Federal Advisory Committee Act (Election Technology Council 2008).

This brief glimpse at the technology of voting barely scratches the surface. The key point for present purposes is that technology, legal mandates, and standards are all changing, and not in a coordinated fashion. This situation is a matter of grave concern for LEOs who have to implement federal and state decisions affecting voting technology. Hite (2007) has provided a useful overview of electronic voting, including such oft-neglected issues as intergovernmental relations, system reliability, ease of use, and cost effectiveness. Current research on the management of information technology and the introduction of new technology is clearly relevant (Garson 2003). Because of the important role of private vendors and the proprietary nature of the software, principal–agent theory seems an appropriate tool, as does the theory of normal accidents (Moynihan 2004).

Ballots

All jurisdictions use ballots (paper, card, or electronic) to present candidates and issues to voters. A long line of research on roll-off and name-order effects has shown that ballot design can affect voting behavior, and the case of the butterfly ballot in the 2000 presidential election showed just how important those effects could be (Wand et al. 2001). Neimi and Herrnson (2003) have argued that the butterfly was not unique among U.S. ballots as a source of confusion, and recent studies of the undervote in Florida's Thirteenth Congressional District also point to ballot design as the most likely cause (Barkakati 2008; Herrnson et al. 2008). In an effort that can help LEOs improve ballot design, Kimball and Kropf (2005) used theories from survey research to identify characteristics of paper ballots that may cause confusion, and they tested their propositions against county-level residual votes in five states. The results show significant relationships between ballot design features and residual votes, with the effects being greatest in counties with large African American populations.

LEOs design ballots under a number of constraints, including state laws on structure and ballot access rules, minority language requirements for jurisdictions covered by the VRA, the type of voting equipment used, and the various combinations of offices and issues for

which people are eligible to vote, depending on where they live within the jurisdiction. For example, Los Angeles County, the nation's largest local election jurisdiction, prepared 818 different ballot combinations and used six languages in addition to English for the 2004 general election (McCormack 2005). The process is under strict time constraints.

Ballot preparation and delivery are critical where paper ballots are used. In this case, the LEO–printer relationship is a candidate for principal–agent analysis. Although LEOs can see and, in principle, proof the ballots, they have to rely on vendors to produce and deliver them on time, a process that LEOs cannot monitor directly.

Precincts and Voting Sites

Election officials have to find, and often rent, space in which to hold elections. Schools, churches, government buildings, and hotel ballrooms are examples. Requirements include parking and/or public transportation, Americans with Disabilities Act (ADA) compliance, climate control, adequate power outlets for the type of voting equipment to be used, and traditionally, a location within the boundaries of each precinct. This last requirement can be relaxed where state law allows the consolidation of multiple precincts in a single building.

Some jurisdictions have sought to reduce the number of precincts and polling places to save money or to find sites that meet all requirements. Another impetus comes from the HAVA requirement that each precinct be equipped with at least one voting device that allows the disabled to vote in private without assistance. The literature on the costs of voting predicts that a reduction in voting sites increases the distance that some voters will have to travel and thus increases the cost of voting. Brady and McNulty (2005) found precinct consolidation in Los Angeles had a negative effect on turnout. Gimpel and Schuknecht (2003) and Haspel and Knotts (2005) found relationships between accessibility of polling places and turnout. However, Stein and Vonnahme (2008) found that a reduction in voting sites as part of a voting center program (described later) actually increased turnout.

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A GAO survey found that selecting polling places was not a difficult task for most LEOs but that large jurisdictions were more likely to experience problems than small ones (GAO 2006, 190–91). Selection does involve networking, as LEOs interact with political interests who are concerned about the effects of location on access for their constituents and with advocates of the disabled to ensure ADA compliance.

Voting Operations

All of the streams of preparatory activities come together at polling places on election day. It is here that the effects of administration on residual votes hypothesized by Ansolabehere and Stewart (2005) might have their greatest impact. Instructions to voters, the availability of poll workers to answer questions, and the difficulty of identifying and correcting voter errors could all matter. For example, optical scan equipment that reads ballots at the precinct can be set to return ballots with overvotes or even undervotes, and DREs equipped with VVPATs print out paper records for voters to review. But if a voter becomes aware of an error, how much trouble (and possible public embarrassment) will be involved in correcting the error?

HAVA mandated new rules for polling operations. LEOs must post instructions informing voters of their rights. New voters who registered by mail must present identification the first time they vote. (A number of states have added more stringent identification requirements.) Voters whose names are not on the poll list must be given an opportunity to vote using a provisional ballot and a means to find out later whether the ballot was counted. Electionline.org (2005) reported implementation issues with regard to provisional ballots in the 2004 general election. HAVA also mandates a complaint procedure that can involve CEOs in problems that are not resolved locally.

There is little research on the actual operations of polling places. Mebane (2004) pointed out that failure or nonuse of the "second-chance" option on precinct-counted optical scan equipment caused two Florida counties to produce residual votes comparable to those in punch-card counties. Highton (2006) showed the negative effect of too few voting machines on turnout. New voter identification requirements have become a contentious issue, part of a broader debate on fraud and intimidation (Eagleton/Moritz 2006; Barreto, Nuno, and Sanchez 2007; Mycoff, Wagner, and Wilson 2007).

All of the activities at polling places, except individual votes and the internal workings of electronic voting equipment, are, in principle, observable. However, the large numbers of polling places, typically spread throughout a county, the number of voters involved, and the tight time limits make observation and detailed control virtually impossible (Alvarez and Hall 2006). Moynihan's (2004) application of normal accident theory can be extended from DREs to the entire polling place operation. The streams preparatory activity described earlier are linear, but when they

come together at the polling place on election day, the interaction is complex, and the strict time constraints make them tightly coupled. Accidents happen, and they should be expected. They are usually small, many are correctable, and the decentralized nature of the system tends to localize them—unless the race is very close.

Alternative Voting

Alternatives to traditional voting in polling places are an increasingly important part of the electoral process. There are two basic types: early voting, in which one visits a central office before election day to cast a ballot, and various programs of distance voting. Oregon is a special case because all elections are held by mail (Southwell 2004). A good bit of research has examined the socioeconomic, psychological, ideological, and partisan differences of absentee and in-precinct voters, finding that the characteristics of the former make them more likely to vote in any case (Barreto et al. 2006). (See the description of election day vote centers in the next section and in the articles by Bruce Cain, Karin Mac Donald, and Michael Murakami and by Pat Hollarn in this symposium for examples of alternative voting systems.)

Counting

Votes from polling places and alternative voting systems must be combined to produce totals. The processes are straightforward except when decisions are required regarding the eligibility of provisional ballots or of mail ballots with irregularities and when interpretation is required for ballots that are not read by machine. Florida, like a number of states in the 2000 election, used an intent-of-the-voter standard, which left considerable room for interpretation. The GAO estimated that 32 percent of the jurisdictions in the United States had no written instructions on how to count such ballots (2001, 18). HAVA required each state to create uniform standards by 2006. A 2006 GAO survey found that 39 states and the District of Columbia had done so by 2005.

Audit

There are many different ways to audit an election. A canvass, in which LEOs and their staff check returning precinct reports to be sure that total votes and total voters match, is routinely conducted in all jurisdictions. Recounts are common procedures to discover and, if possible, correct errors in an election. In 2001, all but three states had laws prescribing procedures for recounts at the request of a party with standing, and 17 required an automatic recount in case of a tie or if the margin of victory was within a certain percentage (GAO 2001, 231–35).

A significant minority of states have adopted postelection audits beyond requirements for canvasses and automatic recounts. At least 10 states now require audits of all or some local jurisdictions, and 10 more states permit them (GAO 2006, 271). Such audits can take a variety of forms, from recounts of sampled precincts or voting devices to extensive reviews of all related processes and procedures. Sampling theory is applicable here, as a number of papers now available online attest (Appel 2007; California Post-Election Audit Standards Working Group 2007; Mebane, Sekhon, and Wand 2003). Herron and Wand (2007) reported a technique, which they applied in New Hampshire, for using a statistical analysis of precinct returns to evaluate possible irregularities.

Contest

Contests are not administrative tasks but judicial proceedings based on allegations of irregularities affecting election outcomes. They are typically decided in courts or legislative bodies. Nevertheless, election administrators and other stakeholders need to understand the bases on which elections can be overturned in order to minimize postelection challenges. Barry Weinberg (2006) has authored a very accessible review of legal principles governing election challenges.

Summary

Election administration comprises a set of distinct tasks that involve different participants, organizational relationships, types of interaction, and levels of coupling. Federal and state mandates are affecting each task, causing change and adaptation to be major characteristics of election administration today. A variety of theoretical perspectives used in public administration are relevant to the study of election administration. The final section of this paper reports an initiative by a local election official that illustrates both the interaction of tasks and the value of management.

Election Day Vote Centers

Scott Doyle, county clerk and recorder in Larimer County, Colorado, pioneered the concept of Election Day Vote Centers (EDVC). An evolutionary step beyond early voting in which all voters cast their ballots at a central site, the EDVC system drastically reduces the number of polling places on election day but allows registrants to vote in any one of them in the county. Larimer County introduced EDVC in 2003. A careful evaluation by Stein and Vonnahme (2008) showed that turnout actually increased, and the effect was greatest among those least likely to vote. The system has now spread to other Colorado counties, but when Denver used it in 2006, there were major problems and long lines at polling places. These experiences provide useful insights into election administration.

Educated as an environmental engineer, Doyle had experience in government and private business before his involvement in election administration, initially as

deputy clerk. He saw the existing system as essentially unmanageable. The multiple streams of activity that merged on election day, the large number of voting sites (122 in a general election), and the necessity of relying on essentially volunteer poll workers, all in a rapidly growing county, made errors likely and correction difficult. In other words, it was a setting for normal accidents (Perrow 1999).

Doyle was elected clerk and recorder in 2002 upon the retirement of his predecessor. After consultation with the political parties and Secretary of State Donetta Davidson, a former LEO and now a commissioner of the Election Assistance Commission, and with the approval of the county commission, he instituted the system in 2003. This was an off-year election with few races and the expectation of a low turnout. It was a low-risk trial. For the first implementation of the system, he relied on existing statutory authority, which allowed counties to consolidate multiple precincts in one polling place, a common practice in many states. His innovation was to consolidate *all* precincts into *each* of 25 polling places. (Colorado subsequently enacted legislation to permit EDVCs as a county option.) Preparation included briefings for candidates and extensive publicity for voters. It also required detailed planning to change the election process.

Voter registration did not change, but the need for registration information at the voting sites did. In common practice around the United States, each voter's name appears on a printed list in only one polling place. To prevent repeat voting, poll workers mark off the name as each voter is identified. That system would not work if voters could go to any polling place. The Larimer solution was to create an electronic poll book with computer connections between each voting site and the central office. Whenever a voter approached at any site, an official would access the central file and, upon finding the voter's name, electronically mark it so that the same name could not be used at any other site. A useful side effect is that the system eliminates the problem of voters going to the wrong polling place and facing the need to travel to the correct site or cast a provisional ballot, which might or might not be counted, depending on state rules (GAO 2006).

EDVCs also require that there be enough ballots of all types at all polling places. In 2003, Larimer used only optical scan equipment. The county printed and distributed unusually large numbers of ballots in the test election. It also employed ballot counters in the electronic poll book so that it could track the number of ballots used at each site and deliver additional ballots as necessary.

The reduction in the number of voting sites from 122 to 25 enabled the county to be more selective in the choice of polling places and poll workers and to save money on these expenses as well as voting equipment. It could select and pay for the most desirable sites based on such features as size, climate control, parking, accessibility for the disabled, proximity to major population centers, and access via major roadways. The choices required coordination with party representatives who, by law, must participate in the selection of sites. The reduction in polling sites significantly reduced the number of poll workers needed, enabling the county to be more selective in this choice as well. It also allowed Doyle to station one or more full-time staff at each site. Like many LEOs, Doyle has responsibility for functions other than elections; in this case, he trained staff from motor vehicle registration and assigned them to polling places on election day.

Because HAVA now requires that each polling place have one or more voting systems that allow people with disabilities to vote without assistance, continuation of the old precinct system would have required at least 122 DRE machines. Larimer County purchased DREs for each of its 25 (now 33) polling places and gives all voters a choice of using them or the optical scan ballots. The reduction in polling places also allows more active management by the LEO. On an election day, the county has prepositioned vans with teams of technicians and extra poll officials to respond to problems that occur.

The Larimer County EDVC system appears to be quite successful. Accounts from the local press are very positive, and as noted, turnout has increased. The fiscal impact of the system has not been calculated yet, but Doyle thinks the savings in polling places, poll workers, and DREs at least offset the costs of extra ballots, computers, and information technology. The case illustrates the use of management and technology to meet growing challenges of election administration. But the system does require a high level of both management and technology. The fact that it works well in one jurisdiction does not guarantee that it will do the same in another, as Denver's experience in the general election of November 7, 2006, illustrates.

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Denver has a consolidated city–county government headed by an elected mayor, council, and auditor. The election office was headed by the Denver Election Commission (DEC), which consisted of the city clerk, a mayoral appointee, and two elected commissioners. The DEC hired an executive director, who oversaw the staff.

The 2006 general election was the first big test for the EDVC implementation there. Trouble

occurred simultaneously at multiple voting sites as the electronic poll book that linked them to the central voter file slowed, then stalled. Long lines developed. Poll workers tried to use provisional ballots but ran out. The *Denver Post* reported waits as long as three hours, resulting in some voters giving up (Merritt and Human 2006). Eventually, everyone who stayed in line got to vote, but the process brought outcries from elected officials and voter advocates.

The mayor and council president appointed a review panel, which took testimony, reviewed reports, and issued its own report in December (Denver Election Commission Investigative Panel 2006). The commission found a number of problems, which, they concluded, were "symptomatic of an unacceptable casual and substandard tradition of technology management at the DEC" (2006, 4). The primary problem was the electronic poll book that the DEC had acquired from a vendor. The system was designed to handle a number of simultaneous queries, but there was no mechanism to automatically close the link from a voting center laptop to the central data file after a query (Human 2006). As more and more "windows" were opened and remained open, the system stalled. Poll workers tried to compensate by calling the DEC, but there were not enough phone lines. The panel also found an inadequate number of laptops and voting center staff, as well as poor training, inadequate contingency plans, and unclear policies. It recommended a reorganization of election administration in Denver.

The successes and failures of EDVC systems are indicative of a broad trend in election administration.

> Significant changes in the statutory and regulatory requirements for conducting elections . . . have forced election officials throughout the country to reevaluate voting procedures. These changes combined, in many cases, with an increasing role of technology have led to a dramatic increase in the complexity of elections and, as a result, in the demands on the organizations that manage elections. (Denver Election Commission Investigative Panel 2006, 2)

If we look at Doyle's effort to pioneer the program, we see many management tasks made familiar by the acronym POSDCORB. He had to carefully plan and organize the activities. EDVC allowed significant staffing changes, which he used to good advantage. The reduced number of polling places increased his ability to monitor and direct activities on election day. The effort required substantial coordination with other parties. He reported in advance through an extensive public information campaign and after the fact with presentations to stakeholders in his own community and interested professionals nationwide. The EDVC program required major budgetary changes, although the net effect after one-time costs are amortized remains to be calculated.

Conclusion

Election administration in the United States is undergoing significant changes as waves of federal and state policies ripple through the system, sometimes encountering other ripples generated by local innovations. Most research to date has addressed discrete components of the system, especially voting technology. Yet the performance of U.S. election systems depends on the interaction of people, processes, and technology in clusters of networks characterized by multiple types of relationships. There is an urgent need for additional research to complement existing studies by focusing on the whole system, the interconnectedness of its parts, and the pace with at it can implement new policies.

An appreciation of task complexity calls for greater attention to the roles of and relationships among election officials. The demands of the job have increased dramatically. Management is important, both in the traditional POSDCORB variety and in the more recently recognized skills of network management. Does it matter that most LEOs are elected? What difference do professional networking and education make? Is there a significant development gap between larger, wealthier jurisdictions and smaller, poorer ones? How is the changing intergovernmental structure affecting performance?

Public administration has much to contribute and something to learn. A number of approaches commonly used in the study of public administration are relevant. If so, we should be able to apply this knowledge to understand problems and give advice, and the application should broaden our understanding of existing theories. We also need to complement current research methods with case studies to capture the complexity of impacts from multiple policy changes on the implementing agents.

Finally, if Perrow's theory of normal accidents applies, we should expect them. The very features designed to prevent abuse of concentrated power—decentralization and fragmentation of administration, and reliance on the public in their roles of poll workers, poll watchers, and voters—plus rapid changes in the system all increase the chances for errors. A great deal of work is now under way to improve system designs for minimizing, detecting, and correcting errors. The trick will be to design and implement procedures that take into account system complexity and resource needs.

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