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Contingent Professionalism: Bureaucratic Mobility and the Adoption of Water Conservation Rates

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ABSTRACT

Professional networks are widely recognized as important sources of environmental protection policy innovation. I argue that innovations are most likely to diffuse from professions to governments under conditions of bureaucratic job mobility. When an agency head arrives from outside the government he serves, she carries both a reputation and mandate for innovation. The incentives for innovation are less potent when an agency head is promoted from within. The result is *mobility-contingent professionalism*, for the priorities of an administrator's profession are more likely to become manifest in policy when she arrives from outside than when she is promoted from within an agency. Analysis of data from an original survey of water utility executives tests the effect of career path and professional involvement on utilities' adoption of conservation-oriented water rate structures. I find that executive career path is a strong predictor of an agency's adoption of conservation rates, even after accounting for climatic and institutional conditions. Further, the effect of professional involvement is contingent on career path: Professionalism is strongly associated with adoption of conservation rates for diagonally mobile executives but not for executives promoted from within.

INTRODUCTION

Proponents of environmental conservation policies face significant costs and risks in the political arena since effective policies typically regulate or redistribute social resources. As students of the policy process have long recognized, regulatory and redistributive policies are likely to produce political conflict (Hayes 1978; Lowi 1964, among many others). Adoption of new environmental conservation policies, thus, requires policy entrepreneurs who are willing to bear the risks and costs of innovation. Despite their popular depiction as risk averse, public administrators are identified as entrepreneurial drivers of environmental policy innovation in several recent studies (Bernier and Hofsi 2007; Desveaux, Lindquist,

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and Toner 1994; Rabe 1999, 2004; Sapat 2004). In light of the risks and costs of policy entrepreneurship, why do bureaucrats pursue environmental policy innovations?

This article investigates the ways that bureaucratic professions and their labor markets affect the diffusion of environmental conservation policy in the United States. The bureaucrats who serve American local governments are, by and large, career professionals engaged in policy networks with other professionals (Brehm and Gates 1997; Green 1989; Lipsky 1980; Mosher 1968; Wirt 1985). Professional networks can be sources of policy ideas and political resources and so can help explain the diffusion of policy innovations from professions to government agencies (Balla 2001; Mintrom and Vergari 1998). That bureaucrats sometimes emerge as environmental policy entrepreneurs also is well known, as noted above. We know little, however, about why bureaucrats in some agencies are more likely than others to drive environmental policy innovations. Why do some administrators introduce policies from their professions into the agencies that they serve, whereas others do not? When is a bureaucrat likely to push an environmental policy favored by her profession?

This article argues that bureaucratic job mobility increases the likelihood that environmental protection policies will diffuse from professions to governments. When an agency head arrives from outside the government she serves, she carries both a reputation and mandate for professional innovation. Conditions are less conducive to professional innovation when an agency head is promoted from within. The result is *mobility-contingent professionalism*, for the priorities of an administrator's profession are more likely to become manifest in policy when she arrives from outside than when she is promoted from within an agency. In short, in matters of environmental conservation policy, professionalism matters more for the mobile bureaucrat. Mobility-contingent professionalism offers a new way to think about the relationship between professions and the diffusion of innovations across governments.

The present study tests this theory of mobility-contingent professionalism by modeling the adoption of conservation-oriented water rate structures in American public utilities. In addition to being a redistributive environmental protection policy, conservation-oriented water rates are also highly salient and generally favored by the water utility profession today. After reviewing the conceptual issues at hand, I describe how career paths favor more or less diffusion of environmental protection policy through the selection of candidates for administrative jobs. I briefly relate an illustrative case of a utility that recently adopted water conservation rates under the leadership of a professionally active, mobile professional manager. Drawing data from an original survey of water utility managers, I then present a pair of statistical models that demonstrate the ways in which career paths and professional identity affect conservation policy adoption. Finally, I summarize the results of the analyses and highlight their theoretical and normative implications for the study of policy diffusion generally and environmental policy particularly.

ENVIRONMENTAL POLICY ENTREPRENEURS

Scholars have sought to understand the process of policy innovation in government since Walker's (1969) seminal article on the spread of policies from state to state. *Innovation* in these diffusion studies means the introduction of a policy new to the government adopting it. Studies of innovation have isolated a number of social, economic, and institutional correlates of policy diffusion and so have identified several conditions that promote or inhibit

the spread of innovations from one government to another (Berry and Berry 1990, 1992; Boehmke and Witmer 2004; Feiock and West 1993; Sapat 2004; Shipan and Volden 2006; Turner and Cassell 2007; Walker 1969; Zahran et al. 2008, among others). Over the past decade, studies of policy diffusion and innovation have begun to pay attention to the specific mechanisms by which diffusion occurs and to the people whose political decisions cause innovation (Balla 2001; Mintrom 1997; Mintrom and Vergari 1998). These studies identify *policy entrepreneurs* as important causes of policy innovation. Policy entrepreneurs are individuals who recognize latent demand for new policies and then expend resources and bear political risks to drive policy innovation (Kingdon 2003; Schneider, Teske, and Mintrom 1995, among many others).

Policy entrepreneurs figure especially prominently in recent studies of the diffusion of environmental protection policies. Elected officials seize entrepreneurial opportunities to advance environmental policies at the local (Bulkeley and Kern 2006), state (May and Koski 2007), national (Milazzo 2006), and international (Tews, Busch, and Jörgens 2003) levels. Bulkeley and Betsill's (2003) study of local governments' responses to climate change identifies entrepreneurial bureaucrats as drivers of policy innovation. Similarly, Rabe (1999, 2004) finds that professional administrators frequently emerge as entrepreneurs who drive innovations in pollution control and climate change policy. That entrepreneurs are significant in environmental protection politics is unsurprising since environmental policies are regulatory and/or redistributive. Regulatory policies control the use of private resources, whereas redistributional policies affect the distribution of resources among individuals. Regulatory and redistributional policies are prone to controversy and so are costly and risky to pursue (Hayes 1978; Lowi 1964).

Balla (2001) and Mintrom and Vergari (1998) find that involvement in professional policy networks is related to the diffusion of policy innovations. With respect to environmental policies in particular, Rabe (1999) finds that entrepreneurial administrators borrow innovative policy ideas from "policy communities" related to their professions. In these studies, professional organizations and related issue networks are resources that policy entrepreneurs draw upon in pursuit of innovation.

Several accounts of administrative behavior suggest that the process of professional accreditation (through formal education, apprenticeship, and so forth) imbues individuals with the ethics of their professions (Brehm and Gates 1997; Lipsky 1980; Meier and O'Toole 2006; Mosher 1968; Wilson 1989). Steeped in the cultures of their professions, administrators come to understand good and bad policy according to the conventions of their professional peers, goes the argument; this socialization process causes administrators to be, as Brehm and Gates put it, "principled agents." An administrator's preference for the policies favored by his profession may follow from his very identity as a professional, gained through years in college, graduate school, and service in the ranks of his fellow professionals.

Left unanswered is why professional bureaucrats-turned-entrepreneurs bother pursuing innovation in the first place. Invoking Mohr's (1969) theory of organizational innovation, Berry and Berry (1990, 399) identify two factors that increase the probability of innovation in organization: "(1) the motivation to innovate and (2) the availability of resources for overcoming obstacles" to innovation. Theories of policy innovation to date have had much to say about the latter but scarcely anything systematic about the former. Why do policy entrepreneurs—especially bureaucrats, whose jobs may be at stake—bear

the costs and risks of innovation? As Tews, Busch, and Jörgens (2003, 593) observe, "... the question about the concrete motivations of policy makers to adopt environmental policy innovations is still unanswered."

The approach of Berry and Berry (1990) to the motivational question is typical of policy diffusion studies: they conceptualize the motivation to innovate in terms of a need or problem that demands a policy solution. Since the policy they study is adoption of state lotteries, Berry and Berry use a state's fiscal condition as an indicator of its motivation to innovate. Similarly, the study by Zahran et al. (2008) of local climate change policy uses vulnerability to natural disasters as a measure of motivation to adopt climate change policy. This approach is appropriate when the objective of the study is to find economic, institutional, and social correlates of innovation. But when examining a diffusion-by-policy-entrepreneur model, to conceptualize "motivation to innovate" as a public need is to conflate individual goals with organizational goals. As organization theorists have long recognized, individuals do not necessarily share the goals of the organizations in which they work (Simon 1997). It is one thing for a local utility to suffer a drought; it is another for a bureaucrat to assume costs and risks in pursuit of a controversial policy to address the crisis. On its own, need for a policy is an inadequate explanation for the emergence of policy entrepreneurs.

As Kingdon (2003) described them, the defining characteristic of policy entrepreneurs is "... their willingness to invest their resources—time, energy, reputation, and sometimes money—*in the hope of a future return*" (123, italics added). Kingdon suggests that entrepreneurs may champion policies that they believe are important, or that they simply enjoy the act of political engagement in itself. At first blush, professional socialization would seem to underlie the "willingness to invest resources" and to offer the "future return" that Kingdon specifies.

But professional identity alone is theoretically problematic as an explanation for bureaucratic policy entrepreneurs. Professional identity and the prestige associated with a profession are collective goods that offer free-riding opportunities for professionals. A bureaucrat may enjoy good standing in her profession and the prestige and perquisites of office without incurring the costs of championing her profession's favored causes. It is not clear why administrators would take significant political risks in the name of professionalism alone. Moreover, professional socialization fails to account for variation in administrators' pursuit of professionally sanctioned goals. In an age when virtually every government agency of any substantial size is staffed by professionals, why do professional innovations emerge in some agencies and not in others?

THEORY

Kingdon (2003, 123) identifies a third potential motivation that might spur policy entrepreneurs to innovate: "promoting one's personal career." This study seeks to explain the diffusion of water conservation rates from professions to local governments by focusing on bureaucrats as policy entrepreneurs. Agency heads are well positioned to drive innovation, and their professions provide the "raw materials" of entrepreneurship in the form of new policy ideas. But the incentive to pursue professionally sanctioned innovations lies in the professional labor market, I argue. Professions may have preferred policies, and administrators may be socialized and identify as professionals. But job mobility—the movement of bureaucratic professionals from one government to another—creates conditions under which bureaucrats' professional sensibilities are likely to become manifest in policy. Like most jobs

in a market economy, bureaucratic jobs are temporary matches of individuals with employers. But individuals and agencies do not latch on to one another at random, like so many atoms in Brownian motion. Governments' selection processes and individuals' adaptation to those processes shape bureaucratic behavior and, ultimately, government policy.

Selection

When elected officials hire professional administrators, they are usually laypersons hiring experts. So as in most hiring situations, qualifications and reputation are important factors for elected officials selecting agency heads. But the procedures and criteria applied in selection of agency heads depend on whether bureaucrats are promoted from within the agency or hired from outside.

Professional credentials and reputation are prominent selection criteria for governments hiring bureaucrats from outside (Carlson 1961, Rosenthal and Crain 1968, Wilson 1989). Elected officials rely heavily on the advice of other professionals when vetting and selecting candidates. Local governments hiring agency executives from outside their organizations typically hire executive search firms or consultants specializing in the professions at hand (Ammons and Glass 1988). These search consultants are usually themselves former administrative professionals, and they are influential in framing issues and establishing evaluative criteria (Schall 1997b). With little knowledge about the candidates, elected officials rely heavily on the advice of their search consultants and the candidates' credentials and reputations. Overall, in evaluating external candidates' reputations, local governments hiring from outside scrutinize applicants through the prism of professionalism. If a profession generally favors conservation policies, then governments are likely to favor professionals with a demonstrated interest in or success with such policies.

Few or none of these selection processes apply when organizations promote internal candidates as a matter of policy. Governments promoting from within the organization are familiar with their candidates and select an agency head with whom they are comfortable. Organizations with a standing practice of hiring executives from within the organization almost certainly have fewer candidates for the job—perhaps only one. In some organizations, hiring an agency head is a virtually automatic process: the next school superintendent is simply whoever the assistant superintendent is today (Carlson 1961). No search consultants or professional vetting is necessary when organizations hire from within. References and recommendations are not so important, if they are used at all. Administrators selected through such internal promotional processes arrive at the agency head position through adherence to preexisting agency norms (Kaufman 2006; Schall 1997a).

Of course, many agencies sometimes hire from outside and other times promote from within. The important point here is that governments promoting administrators from within tend to apply different selection standards from those recruiting from outside, perhaps, even when comparing internal and external candidates for the same position. The very act of recruiting candidates from outside the organization indicates, at some level, a demand for innovation (Carlson 1961).

Adaptation

A simultaneous *adaptation* process occurs among mobile administrators. Administrators seeking career advancement observe the behavior of those who successfully "get ahead"

and then mimic this winning behavior (March and March 1977). For the mobile administrator, adaptation means building a professional reputation pursuant to higher status jobs since professional credentials and professional reputation are important selection criteria for higher status agency heads (DiMaggio and Powell 1983). A bureaucrat seeking career advancement via movement to another government will be very active in her profession and will seek to introduce professionally fashionable innovations to her agency. If a profession favors environmental conservation policies, then a reputation for environmental conservation policies is advantageous for the mobile bureaucrat. A bureaucrat hired from outside arrives with a perceived mandate for innovation, for her hiring was due in part to her reputation for professionalism. For administrators not interested in potential movement to a job in another government, adaptation means adhering to organizational norms (Kaufman 2006). A bureaucrat who has advanced vertically within an organization and who is not seeking job options elsewhere is not so interested in pursuing professionally innovative policies and likely has no specific mandate for innovation.

Conditional Professionalism

Consequently, agencies' policies depend in part on their bureaucratic selection processes and individuals' adaptations to those selection processes. A government that hires its agency heads from outside is most likely choosing to hire a "professional" to provide expert advice and service (Carlson 1961). An agency head arriving from outside is likely to perceive a mandate for professional innovation and so is more likely to introduce professional innovations than her peers promoted from within. For professions whose policy sensibilities favor environmental conservation, we would expect environmental conservation policies to follow the hiring of an agency head from outside the agency.

The result is mobility-contingent professionalism. Bureaucrats' political decisions must be traceable to their professional identities if professional socialization is to be useful as a theory of public administration or policy innovation. I argue that professional sensibilities are most likely to materialize as policies where labor market conditions are amenable to them. For political purposes, the mobile administrator is the professional administrator, and professionally sanctioned environmental policies are likely to follow where she goes. With apologies to Forrest Gump, in politics, professional is as professional does.

Conservation Water Rates

For several reasons, water utility service rates provide an excellent subject for evaluation of the theory advanced here. First, water utilities are ubiquitous throughout the United States, and so utility service rates are as well. Although resource and financial conditions vary widely, local governments provide water utility service in virtually every urbanized area in the United States. Wherever water utilities exist, natural resource policies also exist. Few environmental policies are so universally applicable at the local level and, therefore, broadly generalizable in the United States.

Second, though water rate designs are formally adopted into law by elected officials, they are also inescapably technical and are typically developed by and with professional utility managers (Dinar 2000; Timmins 2002). Water rates are designed collaboratively, with both administrators and elected officials involved in the process. Berry's (1979) analysis of electricity rates demonstrates that bureaucratic professionalism can significantly affect utility rate design. That administrators are so involved with rate design makes utility

rates an excellent place to look for the influence of bureaucratic professionalism in policy making. Utility rate setting is among the most visible, politically sensitive tasks that utility administrators must perform. Although other actors are often involved in the rate design process (e.g., elected officials, lower-level staff members, consultants and citizens), it is difficult to imagine a utility setting its rate structure without the significant involvement of its top administrator (AWWA 2004; Dinar 2000).

Third, though American water utilities employ a wide variety of rate structures, they are easily categorized into five basic types[1]:

1. Flat rates, which charge all customers the same amount periodically, regardless of consumption;
2. Uniform rates, which charge a single price for every unit of water consumed at any level of volume;
3. Declining block rates, which charge higher per-unit prices for low volumes of water, but lower per-unit prices at higher volumes;
4. Inclining block rates, which charge progressively higher per-unit prices for water at higher volumes; and
5. Seasonal rates, which charge higher per-unit prices during periods of peak demand or low resource availability, and lower per-unit prices during periods of lower demand or higher resource availability. Seasonal rate variations may be used in conjunction with any of the other four structures.

At the most basic level, principles of price elasticity imply that any rate structure imposing a marginal unit cost greater than zero encourages conservation. However, only the last two structures, *inclining block* and *seasonal* rates are considered conservation oriented for purposes of this study because these rate structures are designed with resource conservation in mind. Inclining block rates raise the marginal cost of water consumption at progressively higher volumes, and seasonal rates raise the marginal cost of water during periods of relative resource scarcity. Any rate structure can be designed to generate a desired level of revenue; the choice to increase or reduce rate revenue is distinct from the choice of rate structure.

Like many other environmental policies, public utility rates have important redistributional consequences, for rate designs necessarily affect the allocation of costs and benefits among customers (Berry 1979; Mullin 2008; Teodoro 2005; Timmins 2002). Utility rates collect revenue as necessary to meet a utility's operating and capital needs. However, utility rates also can be designed to send signals to consumers about socially desirable use of a collective resource. Low prices can promote affordable water for basic sustenance (Hasson 2002; Saunders et al., 1998) or signal a preference for more water use to encourage development, for example. Higher marginal prices can signal a desire to conserve water

1 A sixth rate structure, sometimes called "water budgets" or "individualized rates," has emerged in recent years. These rate structures impose different inclined block price schedules on each customer, based on individual factors like number of rooms, household size, lot size, and vegetation (Chesnutt and Pekelney 2002; Gaur 2007). Although individualized rates are clearly conservation oriented, only a handful of utilities (and none in the surveyed utilities) had adopted such rate structures at the time of the survey.

(Collinge 1996; Gaur 2007; Michelson, McGuckin, and Stumpf 1998). A utility's adoption of a conservation-oriented rate structure is a decision to redistribute resources and so to accept the political risks that accompany redistributive policies. Adjusting water rates in ways that adversely affect high-volume water users is "a political high-wire act" as Postel (1999, 235) has observed. A conservation-oriented water rate structure is exactly the sort of risky, potentially controversial policy that a policy entrepreneur might be expected to champion.

Finally, a distinct and mature water utility management profession exists in the United States, with values and priorities that include water resource conservation. A professional society, the American Water Works Association (AWWA), constitutes and governs the water utility management profession, and it establishes standards of practice, licensure, and ethics that carry the force of law in many states (Corssmit 2005). Dominant norms and values are not static in any profession and, in fact, have changed significantly over time within the water utility profession. Water resource conservation generally, and conservation-oriented water rate structures particularly, have emerged and grown as AWWA priorities over the past three decades. AWWA's general interest conferences routinely feature numerous sessions on conservation, and since 2002 AWWA has sponsored numerous conferences and publications devoted to conservation. The 1972 edition of *Manual M1*, AWWA's manual of practices on water rates, explicitly discouraged the use of pricing as a means of managing demand or promoting resource conservation (AWWA 1972). By contrast, the most recent edition of *Manual M1* devotes six chapters to conservation-oriented rate design, as well as a chapter on securing political support for new rates (AWWA 2000). Conservation-oriented rate structures are among the management practices now clearly favored by the water utility profession, and this relatively coherent professional norm makes a useful subject of study.

Hypotheses

The following hypotheses relate professionalism and job mobility to the adoption of water conservation rates in American local utilities:

> *Hypothesis 1*—Professionalism: The likelihood of a utility adopting conservation water rates increases as the professional involvement of its agency head increases.
>
> *Hypothesis 2*—Mobility: Governments that hired agency heads from outside the organization are more likely to adopt conservation water rate structures than are governments that promoted agency heads from within.
>
> *Hypothesis 3*—Contingent professionalism: For governments that hired agency heads from outside the organization, the likelihood of adopting conservation rates increases as the professional involvement of its agency head increases.

The dependent variable for all three of these hypotheses is the adoption of conservation-oriented water rate structures. Hypothesis 1 relates professional identity to the likelihood of conservation water rate adoption. If professional socialization drives administrators to favor professionally innovative policies, we would expect high levels of professional involvement to be associated with introduction of conservation rates. Hypothesis 2 relates bureaucratic career path or job mobility to the likelihood of conservation water rate adoption. If job mobility encourages the diffusion of professionally fashionable policy

innovations, then we would expect governments hiring agency heads from outside to adopt conservation rates more often than those promoting bureaucrats from within. Hypothesis 3 posits a role for professionalism that is contingent upon mobility: the policy effect of an executive's professional involvement depends on his or her career path. In this way, professionalism becomes manifest in policy when a government signals a demand for innovation by hiring from outside.

AN ILLUSTRATIVE CASE

Though it sits just 20 miles from the shores of Lake Michigan, the fast-growing Milwaukee suburb of Waukesha, WI (population 67,814), faces a potentially serious water supply shortage. By the late 1990s, long-term draws on the city's aquifer had left the city's groundwater contaminated with potentially unsafe levels of radium. Waukesha's water utility offers an illustration of contingent professionalism at work in conservation policy.

Late in 2002, Waukesha hired Dan Duchniak as general manager for its water utility. At 35, Duchniak was an unusually young hire to head a large municipal utility, but by 2002, he had already served utilities in nearby Racine and Oak Creek for several years.[2] As assistant manager in Oak Creek, he helped develop an innovative storage and recovery system to manage the city's aquifer (Duchniak tapped 2002). Duchniak joined AWWA early in his career and became very active in the organization, serving as secretary-treasurer of the Wisconsin section and cofounding the Midwest Utility Expo, an annual regional conference for utility operators (AWWA 2007). In 2007, Duchniak ran for and won a seat on the AWWA's national Board of Directors. His record of professional leadership and demonstrated technical proficiency were central to the Waukesha's decision to hire him (Enriquez 2006).

Since taking over the utility, Duchniak has addressed Waukesha's supply shortage by experimenting with new treatment technology and groundwater management techniques and has pursued new sources of supply, including a controversial proposal to draw water from Lake Michigan. More importantly for the present inquiry, under Duchniak's direction, Waukesha has emerged as a leader in water conservation policy. Waukesha recently introduced a rebate program for efficient fixtures and residential irrigation restrictions. Waukesha was not the first or only Wisconsin utility facing supply problems, but in 2007, Waukesha became the first Wisconsin utility to adopt conservation rates, which Duchniak explicitly characterized as a policy meant to help manage demand (Rinard 2007). "[Waukesha adopted] the most aggressive conservation program in the Midwest," boasted Duchniak. "In the last three years, we cut our [peak demand] by 30 percent and water use by more than 10 percent" (AWWA 2008).

Duchniak's proposal to draw water from Lake Michigan generated opposition from environmentalists and some neighboring governments. Duchniak's predecessor pursued new supply options too, questioned the US Environmental Protection Agency's (EPA) assessment of Waukesha's water quality, and filed suit against the EPA to challenge its enforcement of the radium contamination standard (Caban 2001). But these were not politically risky initiatives since the environmental costs of new supply sources are borne by people outside Waukesha, and lawsuits push environmental issues into a political arena outside local government. By-contrast, curbing demand through rates and watering restrictions are politically risky

2 The average utility manager in the sample in this study is 49.1 yrs old, with a SD of 8.6 yrs.

because they impose costs on many of Waukesha's own utility customers. Irrigation restrictions are *regulatory* policies. Inasmuch as conservation rates impose relatively greater and lower costs on customers with different demand patterns, the new rate structure created relative winners and losers; that is, they are *redistributive*. Not surprisingly, these policies generated opposition from some community members (Enriquez 2007). Pursuit of these conservation-oriented innovations was politically risky for Duchniak in a way that expanded supply, lawsuits, and technological innovations were not.

According to the theory offered here, Duchniak's deep professional involvement disposed him to prefer the professionally sanctioned goal of resource conservation and also gave him ready access to innovations like conservation rates and irrigation restrictions. Hired from outside the city in the midst of an ongoing supply crisis, Duchniak had an effective mandate for innovation from the elected officials who hired him. In short, the conditions were right for an entrepreneur to emerge in Waukesha to introduce conservation policies to the state of Wisconsin. Duchniak also perceived his aggressive pursuit of conservation as improving his standing in the water utilities profession: at the time of this writing, Duchniak had announced his candidacy for the vice presidency of the AWWA, specifically touting his record on conservation in campaign statements (AWWA 2008).

This case is meant to be illustrative, not demonstrative. That is, Waukesha shows how one professionally active, mobile administrator became an environmental policy entrepreneur. Such illustrative cases "make the unfamiliar familiar" and are chiefly useful in helping to understand other kinds of data (Datta 1990, 38). But Waukesha is a single case, and by no means a "hard" one. To gain greater traction on the theory at hand, I turn to data on a wider array of managers and the adoption of conservation rates in their water utilities.

DATA

Cross-sectional data on four groups of variables are used in this study: (1) water rate structures, (2) agency heads' professional involvement and career paths, (3) governance structure, and (4) water resources. Descriptive summaries and simple correlations for the data are included in Supplementary Tables B and C.

Water Rate Structures

Data on rate structures are drawn from an original survey of water utility managers heading American municipal government agencies conducted over the summer of 2006. The survey employed a randomized sample of 150 agency heads, stratified to draw data from agencies of many sizes. A great majority of American water utilities are very small, have little or no professional management, and serve very small proportions of the total US population. A simple random sample would likely offer relatively little data on large and medium-sized governments due to the very high number of small local governments in the United States. As large and medium-sized utilities serve the majority of the US population, stratifying to ensure their inclusion in the sample is important for drawing broadly generalizable conclusions in policy studies (Dziegielewski and Opitz 2004). Stratification also ensures that data are gathered from agencies occupying every stratum of the water utility profession. The survey was administered via an Internet-based questionnaire. Sampled administrators received a prenotification letter via postal mail approximately 10 days prior to the survey launch and then received an e-mailed invitation to participate in the Internet survey. The

Table 1
Water Rate Structures

	Sample[a]			2006 AWWA Rate Survey[b]		
Rate Structure	Seasonal	Nonseasonal	Total	Seasonal	Nonseasonal	Total
Inclining block (%)	**5.7**	**25.7**	31.4	**6.0**	**30.9**	36.9
Declining block	**1.4**	12.9	14.3	**0.5**	22.1	22.6
Uniform	**5.7**	47.1	52.9	**8.3**	28.6	36.9
Flat	**0.0**	1.4	1.4	**0.5**	3.2	3.7
Total	12.9	87.1	100.0	15.2	84.8	100.0
N			70			217

Note: Inclining block and seasonal rate structures (in bold) are coded as *conservation rates*.
[a]Unweighted survey participants' utilities.
[b]Data from AWWA and Raftelis Financial Consultants (2006), *2006 Water and Wastewater Rate Survey.*

response rate was 50.4% of valid cases. Additional notes on the sampling frame are included in Supplementary Table A.

The reported water rate structures are summarized in Table 1. Of the 70 utilities represented in the survey, 22 (31.4%) reported using inclined block rates. Another five utilities reported using a seasonal rate schedule in combination with a rate structure other than inclined block. A total of 27 (38.6%) of surveyed utilities used either inclined block or seasonal rates and so are considered to have adopted *conservation rates* for the purposes of this study. As Table 1 shows, these proportions are similar to those generated by AWWA's 2006 Rate Survey, suggesting that the present sample is reasonably representative of the population of utilities, at least with respect to rate structures.[3] At the time of the survey, every participant's current utility rate ordinance or resolution had been adopted during the participant's tenure as head of the local utility.[4] Data on rate structure adoptions cannot show definitively that the administrators were the sole driving forces behind conservation rates. But the involvement of others in rate design does not negate the impacts of executive mobility and professionalism on the process. As noted above, other studies have demonstrated that senior utility managers are critical to the rate setting process (AWWA 2004; Dinar 2000). The argument here is that mobility and professionalism make environmental policy innovation more likely, but these forces need not work alone.

Career Path and Professional Involvement

Respondents to the survey were asked about their employment history, including whether they arrived at their current jobs via internal promotion or external recruitment. Sixty percent of respondents reported arriving at their current jobs from outside the agency, with

3 A difference-in-proportion test comparing the present sample with the 2006 AWWA Rate Survey reveals no statistically significant difference between the two samples ($z = 1.10$). In Mullin's (2008) sample of 427 utilities, 34% had adopted inclined block rates, compared with 31 percent of the utilities in this study; this difference also is not statistically significant ($z = 0.49$).

4 Independent review of each utility's rate resolution or ordinance verified that the current rates were adopted *after* each survey respondent began service as agency head. In two cases, conservation rates structures had been adopted before the survey respondent began service as agency head but were adjusted during the respondent's tenure (e.g., shift from two-tier inclining block to three-tier inclining block).

40% promoted from within. The analyses here use this measurement as the dummy variable *outside hire.*

Professional involvement is measured with an index that compiles the following indicators, as reported by survey respondents (Cronbach's $\alpha = 0.874$).[5]

- The number of professional society memberships that the administrator holds;
- Whether the administrator serves on any committees of the professional society;
- The number of professional conferences attended in the past year;
- Frequency and depth of reading of professional journals; and
- Whether the administrator consulted with professional peers when addressing a policy issue in the past 12 months.

Descriptive statistics for these indicators of professional involvement are summarized in Supplementary Table D. This approach to professionalism is indirect since it uses a behavioral metric (professional involvement) to capture a sociopsychological phenomenon (professional identity). It seems reasonable, however, to assume that those who identify strongly as professionals are relatively active in professional societies and that such involvement reinforces professional identity; certainly, that is the assumption underlying most theories of professionalism resting on socialization. In any case, this behavioral approach improves upon studies of policy adoption that have used measures of institutional capacity (e.g., agency size, professional recruitment activity) to capture professionalism (Berry 1979; Sapat 2004).

Administrators' gender, race, and ethnicity are potentially important independent variables, too. Minority status might affect administrators' opportunities for participation in professional networks and/or the risks of innovation if the political arenas in which they work are systematically biased in against them. Unfortunately, the data used here offer inadequate variation on these variables to analyze their effects since the sample of utility managers is overwhelmingly male and White, non-Hispanic. The very low frequency of women in the sample may indicate that, as Nancy Burns has put it, "gender has already done much of its work" in utility administration careers before respondents ever advanced to a position where they might be surveyed (2002, 467). The same might be said of race and ethnicity.[6]

Governance Structure

Mullin's (2008) recent study argues that specialized local governance structures affect utilities' adoption of inclined block water rates (or "progressive rates," as she calls them). In Mullin's study, the institutional structure of interest is general-purpose municipalities (such

5 The professional involvement index for *i* is the average of: *i*'s professional memberships relative to the highest number reported in the sample; 1 if *i* is a member of a professional committee, 0 if *i* is not; the number of conferences *i* attended over the past 12 months divided by the highest number reported in the sample; reported reading of professional journals on a scale of 1–5, normalized from 0 to 1; and 1 if *i* consulted a professional peer in another agency pursuant to a policy issue in the past year, 0 if *i* did not. The result is a value between zero and one.

6 Commitments to children, a spouse or a partner might affect the cost of innovation. However, tests for marital status and responsibilities for or children showed that these variables had no substantively or statistically significant effect on conservation rate adoption or professional involvement.

as cities, towns, and villages) versus special district governments (such as water authorities and utility districts). Both general-purpose and special district governments provide water service, but Mullin theorizes that special district governments are more likely to adopt progressive rates under conditions of low issue salience because their specialized purpose makes them more attentive to issues (like water rate design) that might fail to draw the attention of general-purpose governments. Differences between special district and general-purpose governments in the probability of adopting progressive rates diminish where issue salience is higher, she argues. The analyses presented here include a dummy variable for *special district* versus general-purpose governance structure in order to accommodate Mullin's specialized governance theory.[7]

Another institutional feature that might inform the kinds of policies that local governments adopt is council-manager versus mayor-council governance structures (Clingermayer and Feiock 2001; Feiock, Jeong and Kim 2003; Feiock and West 1993). Research on council-manager governments and policy adoption generally focuses on the relationship between elected officials and the city manager, not the effect of institutional form on the behavior of bureaucratic agency heads. A council-manager structure might reduce the probability of a utility manager introducing conservation water rates. As the professionals with most direct access to elected officials, city managers might restrict department heads' access to the legislative process and reduce policy entrepreneurship opportunities for department heads. Under mayor-council structures, department heads might have more direct access to elected officials and so have greater opportunities for policy entrepreneurship. However, the data analyzed here showed no appreciable relationship between conservation rate adoption and council-manager form of government. Moreover, dummies for council-manager form had no significant effect in the multivariate models in this study and so are excluded from the models presented here.

Water Resources

Three variables are included in the models to account for resource scarcity on the likelihood of adopting conservation water rates. Not surprisingly, Hewitt (2000) finds that utilities in hot, dry, sunny climates are more likely to adopt conservation rate structures. Mullin's (2008) analysis of inclined block water rate adoption includes precipitation and daily maximum temperature as variables but uses them to measure the salience of water supply as a political issue, not directly as a need or demand for water conservation.

The present study uses the climatic moisture index (I_m) developed by Willmott and Feddema (1992) as the main measure of water resource scarcity. As a metric of resource scarcity, the I_m has a number of advantages over simple climatic measures like precipitation, temperature, and sunlight because it integrates these variables with the land's water retention capacity and evapotranspiration potential.[8] In this way, the I_m "reflects the

7 Mullin's (2008) study also analyzes the effects of ward versus at-large electoral structures and whether special district boards were appointed or elected. Data for these variables are not available as part of the data set used in this article. However, my analyses of two other institutional variables—partisan elections and full-time elected officials—find that these institutions have no substantively or statistically significant effect on the likelihood of conservation rate adoption.

8 Water scarcity (or abundance) is a consequence of the interactions between precipitation, soil absorption, evapotranspiration, and temperature. Failure to account for those interactions may explain why Mullin (2008) found a modest positive relationship between temperature and the inclined block rates, but no effect for precipitation.

relationships between climate and the availability of moisture at the earth's surface" (Willmott and Feddema 1992, 84). Scaled symmetrically about zero and bounded by −1.0 and 1.0, the I_m also enjoys the advantage of mathematical elegance. An I_m value of zero reflects a climate where available water and climatic demand for water are exactly equal. Negative values of I_m indicate relatively little available moisture, and positive values of I_m indicate relatively more available moisture. To put I_m in more meaningful terms for readers familiar with American geography, the I_m value is .42 for Seattle, .32 for New York City, .13 for Omaha, −.08 for Dallas, and −.80 for Phoenix. The mean I_m in the sample analyzed here is .13. Of course, the I_m does not account for every potentially relevant climatic condition, and short-term fluctuations in temperature or moisture conditions might cause localized or temporary drought conditions. Neither does the I_m account for water quality concerns that might drive water scarcity, as they did in the Waukesha case related earlier. However, the I_m is a scientifically valid metric used by atmospheric scientists and an improvement over simple temperature and precipitation data. The models in this study use the average annual *moisture index* values for each of the agencies' locations as calculated and published by Willmott and Matsuura in 2007.[9]

The models also include a dummy variable to indicate whether the utility's principal source of water is *purchased* from a wholesale supplier. Under a wholesale water purchase arrangement, stewardship of the resource rests with the wholesale producer, not the retail utility. To the extent that utilities purchasing water from wholesalers are insulated from resource constraints, they might be less likely to impose water rate structures out of concern for resource conservation. Moreover, many wholesale contracts between utilities employ a fixed payment schedule, so that the payment from the retail utility to the wholesale utility is insensitive to fluctuations in demand. Such contracts remove much of the financial incentive for the retail utility to conserve water. Utilities buying water from wholesale suppliers might be expected to be less likely to adopt conservation rates.[10]

Finally, the effect of utility size is controlled using the natural *log of customer connections* for each water utility. Larger agencies might be somewhat more likely to adopt conservation rates than their smaller counterparts since design and implementation of conservation rates requires a moderate degree of technical sophistication and capacity. The log transformation is theoretically consistent with the nonlinear nature of agencies' policy needs: differences in agency size should matter less at the high end of the distribution than at the low end. For example, we would expect the substantive difference between a utility with 500 connections and one with 5,000 connections to be greater than the difference between a utility with 30,000 connections and one with 34,500 connections.

ANALYSIS

Since the dependent variable in this study is a binary state (the presence or absence of conservation rates), I test hypotheses using a pair of logistic regression models that predict conservation water rate adoption. Model 1 tests the direct effects of professional identity and career path on conservation rate adoption; Model 2 adds a multiplicative interaction of

9 The archive of the Willmott-Feddema climatic moisture index by Willmott and Matsuura (2007) is available from the Center for Climatic Research at the University of Delaware: http://climate.geog.udel.edu/~climate/.

10 Analysis of the effects of groundwater and surface water as principal sources of supply showed that neither has a substantively or statistically significant effect on the probability of conservation rate adoption.

Table 2
Agency Adoption of Conservation Water Rates

Logistic Regression, Variable (expected effect)	Coefficient (SE) Model 1	Model 2
Professional involvement (+, −)	−1.92 (1.88)	−11.73** (5.09)
Outside hire (+, −)	3.16*** (.95)	−1.55 (2.25)
Professional involvement × Outside hire interaction (+)		11.62** (5.45)
Special district (+)	.88 (.73)	1.29 (.80)
Moisture index (−)	−3.65*** (1.30)	−5.08*** (1.78)
Purchased water (−)	−1.99* (1.08)	−2.67** (1.33)
Log customer connections (+)	.52* (.29)	.61** (.31)
Intercept	−5.96** (3.04)	−2.86 (3.27)
Log likelihood	−29.8	−27.2
Likelihood ratio χ^2	31.7	37.0
$p > \chi^2$	.000	.000
Percent cases correctly predicted	75.0	77.9
N	68	68

*$p < .10$, **$p < .05$, ***$p < .01$, two-tailed test.

professional involvement and *outside hire*. Table 2 reports coefficients, standard errors, and fit statistics generated by the two logistic regressions.[11]

Professional Identity and Career Path

Hypothesis 1 draws a connection between administrators' *professional involvement* and water conservation rates. If administrators' professional identities drive policy innovation, then we would expect that higher levels of involvement in the utilities profession to be associated with greater likelihood of conservation rate adoption. The results of Model 1 do not support this hypothesis. In fact, Model 1 finds a slightly negative (albeit statistically dubious) effect of professional involvement on the adoption of conservation rates. This result casts doubt on bureaucratic professional socialization alone as a driver of agency policy making.

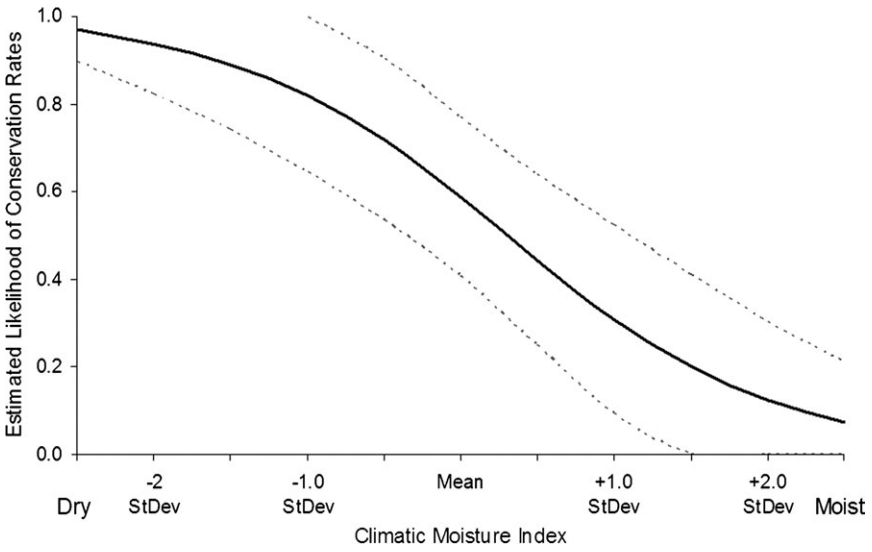
Model 1 affirms Hypothesis 2; however, agencies are much more likely to use conservation rate structures if they hire their agency head from outside the organization, even when controlling for relevant climatic conditions. With other variables held at their means, Model 1 predicts a .595 likelihood of conservation rates for utilities that hired an agency head from outside, compared to a .059 likelihood for utilities that promoted from within.[12] To relate this finding in more intuitively meaningful terms, figures 1 and 2 present the estimated likelihoods of utilities using conservation rates at different values of the moisture index, with other variables held at their means. Figure 1 presents the estimates for agencies with executives hired from outside; figure 2 shows the same estimates for agencies with executives promoted from within.

The disparity between utilities with agency heads hired from outside and those with agency heads promoted from within demonstrates the effect of executive job mobility. The

11 Variance inflation factor tests revealed no significant multicollinearity effects in Model 1, and only mild multicollinearity for the interaction terms in Model 2.

12 The 95% CIs are [.413, .777] for utilities hiring from outside, [−.031, .148] for utilities promoting from within.

Figure 1
Effect of Climatic Moisture on Conservation Rate Adoption for Agencies with Executives Hired from Outside Based on Model 1 Estimates (see Table 2). Dotted Lines Show 95% CI



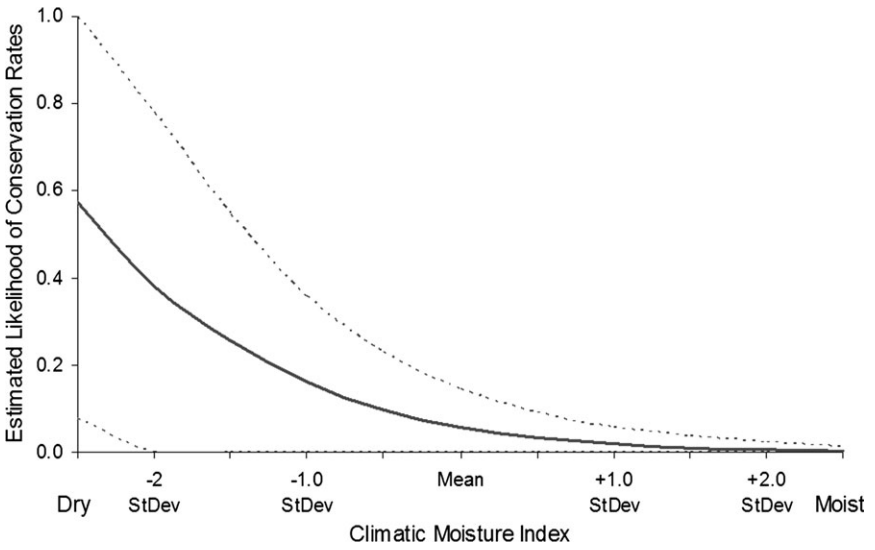
differences are greatest and statistical confidence the highest at the middle of the climatic moisture range. At the high and low ends of the moisture scale, the relative abundance or scarcity of water attenuates the differences between agencies with executives hired from within and those with executives hired from outside. But under moderate climate conditions, bureaucratic mobility has a substantial impact on the likelihood of conservation rate-adoption. Agency heads hired from outside are likely to endorse, support, or sustain conservation water rates, *even under conditions of relative resource abundance.* Coupled with the rejection of Hypothesis 1, this finding suggests that job mobility, not professional identity, encourages the diffusion of environmental conservation policies.

Contingent Professionalism

According to Model 2, professional involvement is a strong, positive predictor of conservation rates for agencies with executives hired from outside and a very strong negative predictor of conservation rates for agencies with executives promoted from within. Figure 3 depicts the marginal effect of career path on the likelihood of conservation rate adoption generated by Model 2 for bureaucrats hired from outside and for those promoted from within, at varying levels of professional involvement. Career path has little impact on conservation rate adoption for administrators with low professional involvement. The upward slope and narrowing confidence interval (CI) in figure 3 indicates that the substantive and statistical effect of career path increases as professional involvement increases. In other words, a high degree of professional involvement for an agency executive makes more of a difference in policy outcomes when she has been hired from outside the agency.

On its own, professional identity does little to affect conservation rate adoption, as Model 1 shows. For administrators promoted from within, professional values apparently

Figure 2
Effect of Climatic Moisture on Conservation Rate Adoption for Agencies with Executives Promoted from within Based on Model 1 Estimates (see Table 2). Dotted Lines Show 95% CI



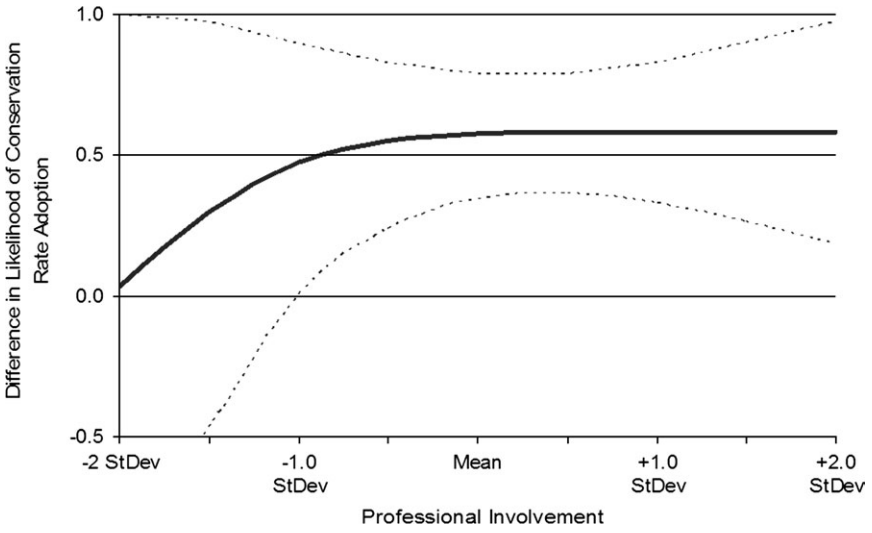
are not reflected in conservation rate design. However, for administrators hired from outside, professional identity is manifested in policy. Also, the effect of job mobility on conservation rate adoption is contingent on professional identity. The positive effect of job mobility on conservation rates in Model 1 turns negative in Model 2. This shift suggests that professional policy innovation does not follow from mobility alone and that mobility in absence of professional identity may actually reduce the probability of conservation rate adoption. Taken together, these results affirm Hypothesis 3 and are powerful evidence for a theory of mobility-contingent bureaucratic professionalism.

Controls

The variables measuring water scarcity generally conform to expectations in both models. The moisture index is a strong predictor of conservation rates in both models, with higher (wetter) values predicting lower likelihood of conservation rates and lower (drier) values predicting higher likelihood of conservation rates. For example, under Model 1, an agency located in a relatively moist place like Allentown, PA, with a moisture index value of 1 standard deviation (SD) above the mean ($I_m = .447$), has a .118 likelihood of adopting conservation rates with all other variables at their means. For an agency in a relatively dry place like Austin, TX, with a moisture index value of 1 SD below the mean ($I_m = -.189$), the estimated likelihood of adopting conservation rates is .577.[13] Not surprisingly, at the time of this writing, Austin's water utility used conservation-oriented rates, and Allentown's did not.

13 Under Model 2, the estimated likelihood of conservation rate adoption is .058 for an agency in the high-moisture location ($I_m = .477$) and .611 for the low-moisture location ($I_m = -.189$).

Figure 3
Marginal Effect of Career Path on Conservation Rate Adoption Based on Model 2 Estimates (see Table 2). Figure Shows the Difference in Likelihood of Conservation Rate Adoption between Agencies with Executives Hired from Outside and Agencies with Executives Promoted from within, at Different Levels of Professional Involvement. Dotted Lines Show 95% CI



Purchased water is likewise associated with lower likelihood of conservation rates in both models. With other variables held at their means, Model 1 estimates a .081 likelihood of conservation rate adoption for utilities that purchase water from wholesale suppliers, compared with .392 for utilities that produce their own water.[14] These results suggest that wholesale purchases insulate retail utilities from the risk of resource depletion and so reduce the incentive for conservation through rate design. Agency size also is positively correlated with conservation rate adoption in both models. Model 1 estimates a .402 likelihood of conservation rates for a utility serving 25,000 connections, compared with a .544 likelihood for a utility serving 75,000 customers, again with other variables evaluated at their means.[15]

Although the magnitudes of the effects are fairly small, *special district* governance structure increases the likelihood of conservation rates in both models, though the statistical reliability of the finding is modest ($p = .225$ in Model 1, $p = .105$ in Model 2). These results are essentially consistent with Mullin's (2008) theory of specialized governance.[16] With their

14 Under Model 2, the estimated likelihood of conservation rate adoption is .036 for a utility that purchases water from a wholesale supplier and .352 for a utility that produces its own water.

15 Under Model 2, the estimated likelihood of conservation rate adoption is .349 for a utility serving 25,000 connections and .512 for a utility serving 75,000 customers.

16 Mullin (2008) also finds a significant interaction effect for special district governance and temperature. I developed a similar model using the moisture index instead of temperature. The results of that model are consistent with Mullin's findings.

particular focus on water supply, special districts are more likely to adopt potentially controversial innovations like conservation water rates than are general-purpose governments.

DISCUSSION

If professional is as professional does, then job mobility is the mainspring of professionalism. Scholars of professionalism have observed that a profession's economic viability and political power rest on an ability to develop a clientele (or market) and define problems in scientific terms demanding technical solutions (Abbott 1988; Carpenter 2001; Finegold 1995). Several studies of bureaucratic politics argue that professionalism and professional identity explain the policy choices that administrators make. But this study's findings suggest that professionalism is unlikely to have much impact on the diffusion of politically risky innovations to governments unless the professionals enjoy mobility from one agency to another.

Hiring an administrator from outside involves an assessment of professional reputation, and so an external hire signals, explicitly or implicitly, a desire for the kind of policy innovation for which professions are known. Professional sensibilities may abound among bureaucrats everywhere, but job mobility offers license to put professional principles into practice and so opens the door for policy entrepreneurship. Clearly bureaucratic professionalism, job mobility, and policy entrepreneurship are parts of a much more complex puzzle. But when a government hires a professional from outside, professionals are likely to take entrepreneurial political risks, and so the priorities of profession are more likely to become manifest as policy.

These results have significant implications for the diffusion of environmental policy innovation. Entrepreneurs figure importantly in accounts of environmental policy development, in part because such policies are usually regulatory and/or redistributive and, therefore, are politically costly. Bureaucratic professions that embrace environmental conservation policies may facilitate the diffusion of environmental policies across governments. But professionalism alone is unlikely to spur environmental policy innovations, at least when they are politically risky. Professions are most likely to gain traction in the environmental policy arena when job mobility affirms and provides incentives for bureaucratic policy entrepreneurs.

Limitations and Outstanding Questions

Important questions about bureaucratic mobility, professionalism, and policy innovation remain outstanding. This study demonstrates a link between public administration career paths and the diffusion of fashionable conservation policy innovation in the water utilities profession. Similar studies could investigate whether the same patterns hold for other professions (e.g., public health, schools, firefighting), as well. As a profession, water utility management is relatively consistent in its norms, and its predominant policy sensibilities are codified in accessible, formal publications. Moreover, AWWA standards and licensure carry the force of law in many jurisdictions. But such coherence and clout are not uniform across professions and, in fact, may be important variables. What does it mean to advance a professionally sanctioned innovation in a profession where norms are fluid and positions on important issues are unsettled or highly controversial within the profession? Studies of diffusion and mobility across multiple professions could offer traction on this question.

Also left unclear are the implications of mobility-contingent professionalism for governments that feature little or no bureaucratic job mobility. Intergovernmental job mobility

is highly constrained or nonexistent in many state and federal government bureaus, especially in military, intelligence, and law enforcement agencies. If professional innovation is to a significant degree contingent upon job mobility, then for better or worse, innovation and professionalism may be severely blunted in agencies with little or no mobility. The extent to which this theory is applicable or testable in such agencies is unclear.

Finally, the cross-sectional data used in this study limits the analysis to an environmental policy that was professionally fashionable at the time of the survey. The limitations of cross-sectional research design on studies of policy diffusion are well understood (Berry and Berry 1990). This study's use of cross-section data avoids some common pitfalls, however, because the rates in effect at the time that the data were collected were adopted during the tenure of the surveyed bureaucrats, and we may reasonably assume that the utility managers were involved in the rate-setting process. Nonetheless, a study of conservation rate structure adoption over time that traced the career paths and policy decisions of specific bureaucrats would further enhance our understanding of bureaucratic professions and policy diffusion.

CONCLUSION

As long as governments have tried to fashion themselves as democracies, theorists have recognized a tension between efficiency and accountability. With the emergence of public administration professions, theorists have recast this tension as between bureaucratic professionalism and democratic responsiveness (Bourdeaux 2008; Kettl 2002; Mosher 1968; among many others). The enduring reality that professional bureaucrats are deeply and pervasively involved in initiating policy is a potential threat to the democratic responsiveness that elections and legislatures are meant to provide. Nonetheless, bureaucratic professionalism is hard to dismiss as hostile to good governance, as Wirt (1985) observes:

> The professional executive officer is the invisible actor in urban decision making, recalling Shelley: "the awful shadow of some unseen Power floats, though unseen, among us." The professional's "shadow" may be "awful" to those who see in it insensitivity and obstruction of local values and control. But it is difficult to escape the impression that many benefits arrived on the local scene in the briefcases and journals of the professional executive officer (106).

The present study's contribution to the professionalism-versus-responsiveness debate is the finding that professional bureaucrats are not simply loyal to their professional norms but rather are responsive to their professions when employment conditions give them political license to innovate. Mobility-contingency thus softens the conflict between professionalism and responsiveness, and across thousands of local governments in the United States, perhaps, balances these oft-conflicting values.

SUPPLEMENTARY MATERIAL

Supplementary Tables A–D are available at the *Journal of Public Administration Research and Theory* online (http://www.jpart.oxfordjournals.org).

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