

# Characteristics of Innovation and Innovation Adoption in Public Organizations: Assessing the Role of Managers

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## ABSTRACT

Studies of the association between innovation characteristics and innovation adoption at the level of organization are scarce. This study develops direct and moderating hypotheses for the relationship between innovation characteristics, manager characteristics, and innovation adoption in public organizations. The hypotheses are tested using survey data on the adoption of 25 innovations in 725 local governments in the United States and data from a panel of experts. The findings suggest that both innovation characteristics and manager characteristics influence the adoption of innovation; however, they do not reveal significant moderating effects of manager characteristics on the relationship between innovation characteristics and innovation adoption. The implications of the findings are discussed for further research on innovation adoption in the public sector.

Organizational leaders, be they public managers or business executives, view innovation as a source of organizational change, growth, and effectiveness. Academic research also continues to examine the antecedents and consequences of the adoption of innovation in organizations (Boyne et al. 2003; Osborne and Gaebler 1992; Tidd, Besant, and Pavitt 1997; Walker 2004). Prior research on organizational innovation has focused primarily on identifying environmental and organizational conditions that facilitate or inhibit innovation adoption (Damanpour and Schneider 2006; Kearney, Feldman, and Scavo 2000; Kimberly and Evanisko 1981; Moon and deLeon 2001; Rivera, Streib, and Willoughby 2000; Walker 2008). The role of innovation characteristics on innovation adoption in organizations, however, has not received similar attention.

This study focuses on the association between innovation characteristics and innovation adoption in the public sector, specifically, in US local governments, and addresses two research needs. First, organizational innovation researchers often view the adoption of innovation as the adopting organization's response to environmental forces, such as population growth and economic health (Kearney, Feldman, and Scavo 2000; Moon

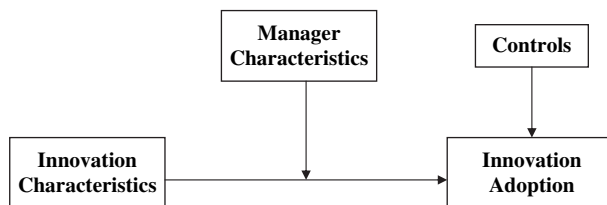
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**Figure 1**  
Conceptual Model



and deLeon 2001), and organizational characteristics, such as size and workforce unionization (Damanpour and Schneider 2006; Rivera, Streib, and Willoughby 2000). We argue that in addition to these external and internal factors, the adoption of an innovation in organizations is influenced by the characteristics of the innovation, such as its cost, complexity and relative advantage, or impact (Rogers 1995; Tornatzky and Klein 1982). Second, because organizations reflect their leaders' influence in encouraging innovation as a means to improve organizational effectiveness and possibly pioneer change which is of benefit to citizens and other stakeholders, we examine the influence of managers' demographic and personal characteristics on the relationship between innovation characteristics and innovation adoption.

Figure 1 shows the study's conceptual model. We first develop direct and moderating hypotheses for the relationship between innovation and manager characteristics and innovation adoption. Then, we test the hypotheses by analyzing the data obtained from three sources (two in 1997 and one in 2003) for 725 local governments in the United States. These organizations constitute an appropriate setting for the study of innovation, as they have experienced fundamental changes since the 1980s because the New Public Management (NPM)/Reinventing Government (RG) reform movement has pressured them to become more efficient and effective (Berry 1994; Box 1999; Boyne et al. 2005; Osborne and Gaebler 1992; Pollitt and Bouckear 2004). We control for environmental and organizational factors and report hierarchical regression models. The findings suggest that both innovation characteristics and manager characteristics influence the adoption of innovation; however, they do not reveal significant moderating effects of manager characteristics on the relationship between innovation characteristics and innovation adoption.

## THEORY

### Innovation Adoption

Innovation is a complex construct and is studied from multiple perspectives at different levels of analysis by scholars from a variety of academic disciplines. At the organizational level, researchers have generally defined "innovation" as the development (generation) and/or use (adoption) of new ideas or behaviors (Amabile 1988; Damanpour and Wischnevsky 2006; Walker 2008; Zaltman, Duncan, and Holbek 1973). The idea or

behavior may pertain to a product, service, technology, system, or practice. Organizations generate innovation for their own use or for use in other organizations. The generation of innovation is a process that results in an outcome that is new to an organizational population (Daft 1978; Damanpour and Wischnevsky 2006). The adoption of innovation is a process that results in the assimilation of a product, process, or practice that is new to the adopting organization (Damanpour and Wischnevsky 2006; Kimberly and Evanisko 1981; Walker 2008).

The innovation adoption process has two major phases: initiation and implementation (Nystrom, Ramamurthy, and Wilson 2002; Rogers 1995; Zaltman, Duncan, and Holbek 1973). The two phases have usually been distinguished by the decision to adopt, that is, initiation and implementation reflect, respectively, the pre- and postadoption decision activities of the innovation adoption process. **This study focuses on the latter phase when the innovation is implemented in the organization.** We assume that organizations innovate with the intention to improve (or to at least maintain) their level of performance or effectiveness.<sup>1</sup> From this perspective, an innovation is not truly adopted when it has been initiated but instead when it has been actually put in use in the adopting organization. Without implementation, the intended objectives of innovating and improving services cannot be met.

### **Characteristics of Innovation**

Zaltman, Duncan, and Holbek (1973) identified over 21 characteristics or attributes of innovation, which were drawn primarily from studies on the diffusion of innovation. Diffusion research mainly examines the adoption of innovation by individual decision makers such as farmers, physicians, and consumers (Fliegel and Kivlin 1966; Menzel 1960; Ostlund 1974; Rogers 1995; Sultan, Farley, and Lehmann 1990) and measures innovation characteristics as perceived by the individual adopter. A review of the relationship between perceived innovation characteristics and innovation adoption in 75 studies identified three characteristics (compatibility, relative advantage, and complexity) that have the most consistent significant relationships to innovation adoption (Tornatzky and Klein 1982).

With few exceptions (e.g., Boyne et al. 2005; Meyer and Goes 1988; Schneider 2007), research which includes innovation characteristics as predictors of innovation adoption is scarce. As Downs and Mohr (1976) observed, at the organizational level the distinction between innovation “primary attributes” (characteristics that are intrinsic to an innovation; e.g., actual cost price) and “secondary attributes” (characteristics as perceived by the individual adopter; e.g., the perception of cost) is necessary (Moore and Benbasat 1991). Primary attributes enable differentiating innovation between organizations; secondary attributes enable differentiating innovations within organizations (Wilson, Ramamurthy, and Nystrom 1999, 311). Thus, innovation characteristics can be represented by two constructs: a macro construct that reflects the characteristics that facilitate or inhibit innovation adoption by organizations within a population, and a micro construct that reflects the perceived characteristics by organizational members that facilitate or inhibit innovation use. This study is interested in the first construct and relies on expert ratings of three characteristics

<sup>1</sup> Walker's (2004) meta-analysis of the innovation-performance relationship and other studies (e.g., Gianakis and McCue 1997; He and Wong 2004; Roberts and Amit 2003) provide empirical evidence for a positive relationship.

(cost, complexity, and impact) of 25 innovations that are adopted in public service organizations.<sup>2</sup>

Innovation cost has widely been examined because cost is a critical component of the efficiency dimension of organizational performance and is a relatively easy characteristic to measure (Fliegel and Kivlin 1966; Tornatzky and Klein 1982; Wolfe 1994). Innovation cost is expected to negatively affect innovation adoption—the less expensive the innovation, the more likely that it will be adopted by organizations (Downs and Mohr 1976; Rogers 1995; Schneider 2007; Tornatzky and Klein 1982). Given resource scarcity in the public sector, the political process of resource allocation, and the NPM/RG reform movement's emphasis on cost reduction, we also propose a negative relationship.

H<sub>1</sub> Innovation cost will be negatively related to innovation adoption.

Innovation complexity is defined as the degree to which the innovation is difficult to understand and use (Rogers 1995; Zaltman, Duncan, and Holbek 1973). Innovation complexity embraces multiple facets of innovation (Gopalakrishnan and Damanpour 1994). For example, complexity can represent the intellectual difficulty associated with understanding an innovation, as in differences between marginal and knowledge-based or low-technology and high-technology innovations (Drucker 1985; Gopalakrishnan and Damanpour 1994; Pelz 1985). It can also represent the originality (the degree of newness) or trialability (the degree to which an innovation may be experimented with on a limited basis) of an innovation (King 1990; Rogers 1995). Innovations which are more difficult to implement, more original, and less trialable are less likely to be adopted by the organization because of higher uncertainty of their success and lower likelihood of their contribution to organizational performance (Gopalakrishnan and Damanpour 1994; Pelz 1985; Rogers 1995).

H<sub>2</sub> Innovation complexity will be negatively related to innovation adoption.

Innovation impact has been expressed in several ways such as economic profitability, social benefit, relative advantage over the program or practice the innovation replaces, and enhanced status of the organization in its industry or among its clients (Nystrom, Ramamurthy, and Wilson 2002; Rogers 1995; Schneider 2007; Tornatzky and Klein 1982). It influences the adoption of innovation positively because the greater the innovation's impact, the greater will be its capacity to help the organization achieve its strategic objectives and meet its performance goals. As public administrators are professionals who have high organizational commitment (Moon 2000) and are motivated to serve the public interest (Perry 1996), they will seek to adopt innovations that are high in impact.

H<sub>3</sub> Innovation impact will be positively related to innovation adoption.

### Manager Characteristics

Innovation is a difficult process that includes setbacks, uncertainty, and conflicts (Page 2005). Public sector organizations are thought to face several particular barriers to

2 In the organizational context, the second construct represents "perceived characteristics of using an innovation" by organizational members (Moore and Benbasat 1991, 194). However, organizational members cannot use the innovation unless it has been adopted by the organization (the adoption decision is usually made by a manager). Therefore, the first and second constructs apply, respectively, to the studies of innovation at organizational and individual levels of analysis.

innovation (Ho 2002; Stone 1981), including lack of incentives, insufficient funding, short-term pressures associated with politics and reelection, and need for public support. Yet, as leaders in their organizations, public administrators and business managers alike can influence workers' motivation and job satisfaction, create a work and social climate to improve morale, and encourage and reward innovation and change (Damanpour and Schneider 2006; Elenkov, Judge, and Wright 2005; Hooijberg and DiTomaso 1996). Therefore, organizational leaders' characteristics are expected to influence the adoption of innovation (Bantel and Jackson 1989; Howell and Higgins 1990; Scott and Bruce 1994; West and Anderson 1996). We first hypothesize the direct effects of managers' demographic and personal characteristics on innovation adoption and then develop hypotheses regarding the moderating effects of some of these characteristics on the innovation characteristic-innovation adoption relationship.

### ***Direct Effects***

On one hand, researchers have argued that a manager's age and tenure would negatively affect innovation and change in organizations. Older managers have been socialized into accepting prevailing organizational conditions and routines and have greater psychological commitment to them; hence, they will be less willing to commit to changing them (Huber et al. 1993). Similarly, whereas managers new to their position are more receptive to innovation because they bring a fresh perspective to their job, managers with longer tenure have been socialized into accepting the organization as it is and are less likely to adopt new ways of doing things (Hambrick and Mason 1984; Huber et al. 1993). On the other hand, in public service organizations, which are often unionized and have managers with longer tenure, seniority is respected and more experienced public administrators have greater insight into the process of performance improvement; therefore, a manager's age and tenure would positively affect innovation and change (Kearney, Feldman, and Scavo 2000).

We combine these competing arguments and propose an inverted U-shaped relationship for age and tenure in public service organizations.<sup>3</sup> Whereas young age and short tenure of managers may negatively influence innovation because they may not be sufficiently familiar with their job and the organization, over time age and tenure facilitate innovation adoption because managers gain experience, become familiar with critical issues that may arise during the innovation process, and learn how to resolve them (Kearney, Feldman, and Scavo 2000). The impact of age and tenure on innovation, however, will reverse when older managers with long tenure accept and identify fully with existing organizational routines and practices. As such, managers' sensitivity to information related to their work responsibilities may mollify their inclination to change the status quo and champion innovation and change (Damanpour and Schneider 2006; Huber et al. 1993). Therefore,

**H<sub>4</sub> Managers' age will have an inverted-U shaped relationship with innovation adoption.**

**H<sub>5</sub> Managers' tenure will have an inverted-U shaped relationship with innovation adoption.**

Education is widely assumed to enhance innovation. New ideas and solutions require knowledge and expertise (Mumford 2000). **Educated administrators and managers are more likely to use complex and diverse approaches to problem solving and decision making**

<sup>3</sup> We thank an anonymous reviewer for recommending nonlinear relationships for age and tenure with innovation.

(Bantel and Jackson 1989; Huber et al. 1993; Lee, Wong, and Chong 2005). Since the newness of innovation creates a sense of uncertainty, educated managers' greater ability to gain information to reduce that uncertainty would facilitate the adoption of innovation (Rogers 1995). Education also inspires receptivity to new ideas, which play an important role in both detecting the need for innovation and creating a favorable environment for its implementation (Damanpour and Schneider 2006).

H<sub>6</sub> Managers' education will be positively related to innovation adoption.

Research findings on the effect of gender on innovation are mixed. For instance, DiTomaso and Farris (1992) found that women R&D engineers tend to rate themselves lower than men do on innovativeness. Although Fox and Schuhmann (1999) found that female city managers tend to view themselves as less entrepreneurial than do their male colleagues, which implies that women are less innovative, they also found that women tend to emphasize community involvement and facilitate communication, which might aid innovation adoption in public service organizations. Sonfield et al. (2001), however, reported no gender differences among business owners in their chosen venture innovation/risk situation strategies, and Damanpour and Schneider (2006) found that gender does not significantly affect initiation, adoption decision, and implementation phases of the innovation adoption process. Leadership research also suggests that despite possible differences in characteristics and values between men and women, there is no strong evidence that such differences would affect their leadership styles or behaviors (Bass 1990; Hooijberg and DiTomaso 1996). Therefore, we assume that gender does not affect innovation adoption.

H<sub>7</sub> Managers' gender will not be significantly related to innovation adoption.

Seminal research in psychology indicates that while situational and personality variables and norms and motivations must be taken into account, beliefs and attitudes tend to affect behavioral intentions, which in turn influence actual behaviors and outcomes (Fishbein and Ajzen 1972). Although these variables may not necessarily determine managerial decisions due to the influence of other factors such as education, job level, and extrinsic rewards, and the causation between attitudes and outcomes is not always clear due to the methodological concerns (Lonti 2005; Walker and Enticott 2004), empirical evidence on the managers' role in innovation and change has emerged in public service organizations. For example, research suggests that there is a positive relationship between managerial support of performance-related human resources practices and their adoption (Lonti and Verma 2003), managers' result-orientation and their perceived autonomy (Lonti 2005), and managers' attitudes and organizational change (Kelman 2005).

The adoption of innovation is also affected by organizational leaders' values, including reinvention values (Moon and deLeon 2001; Rivera, Streib, and Willoughby 2000) and leaders' attitudes or dispositions, including their self-regulation and affiliation with professional organizations (Sabet and Klingner 1993) and perceptions of alignment of their interests and the innovation (Berry, Berry, and Foster 1998). In general, managers' pro-innovation attitude or managerial innovation orientation positively affects innovation adoption (Damanpour, 1991; Moon and Norris 2005). Studies of organizational innovation have found that senior executives influence the adoption of innovation by creating a favorable climate toward innovation (Dewar and Dutton 1986; Hage and Dewar 1973; Nystrom, Ramamurthy, and Wilson 2002). For instance, innovation in information technologies in both public and private sectors is facilitated by managers' proactive orientation toward

adopting new technology (Moon and Bretschneider 2002; Thong and Yap 1995). Public managers who are enterprising and have an entrepreneurial orientation view innovation as a solution to the need for change (Borins 2000; Teske and Schneider 1994).

Although some studies have found no relationship between public managers' attitude toward NPM/RG and adoption of the innovations associated with it (Boyne et al. 2005; de Lancer Julnes and Holzer 2001), Kearney, Feldman, and Scavo (2000) have found support for a positive relationship. We propose that public administrators or managers with a more favorable attitude toward innovation and change would more likely decide to support the ideas that depart from existing practices (instead of those that are more consistent with current practices) and allocate resources to acquire and implement them (Damanpour and Schneider 2006). These managers facilitate innovation by providing support to organizational members for proposing new ideas, building coalitions among different constituencies, and helping coordination and conflict resolution among units and members (Dewar and Dutton 1986; Hage and Dewar 1973; Mumford 2000).

H<sub>8</sub> Managers' pro-innovation attitude will be positively related to innovation adoption.

Research has examined the effect of political orientation (conservative vs. liberal) of managers on innovation (Brudney, Hebert, and Wright 1999; Moon and deLeon 2001) to ascertain if either conservative or liberal leanings encourage or discourage innovation adoption. On one hand, liberal managers are perceived to be more change-oriented than conservative managers, making them more proactive in adopting innovation (Moon and deLeon 2001, 341). On the other hand, conservative managers are more likely to adopt innovation because they are more inclined to control spending and increase efficiency (Moon and deLeon 2001, 341). Moon and deLeon (2001) empirically tested the association between managers' political orientation and the adoption of managerial reforms in US local governments. Using two measures of innovation adoption, they found a positive association between liberal ideology and one adoption index and a nonsignificant association with the other. On the contrary, Brudney, Hebert, and Wright (1999) expected and found support for a positive relationship between administrator conservative leaning and adoption of NPM/RG reforms. In sum, these two studies put forth alternative views aligned, respectively, with liberal and conservative orientations—whereas some aspects of NPM/RG reform support empowerment and decentralization, others aspects support strong executive authority and cost efficiency. Given the opposing theoretical arguments and mixed empirical results, we therefore propose:

H<sub>9</sub> Managers' political orientation will not be significantly related to innovation adoption.

### ***Moderating Effects***

In this section we present alternative hypotheses that some manager attributes might have moderating rather than direct effects on innovation adoption. A moderator affects the direction and/or strength of the relationship between an independent and a dependent variable (Baron and Kenny 1986). We hypothesize moderating roles for four manager attributes—gender, tenure, education, and pro-innovation attitude—on the innovation complexity-innovation adoption relationship, as these manager characteristics might aid an organization's ability to understand and implement complex innovations (details below). We do not hypothesize moderating relationships regarding innovation cost and impact, as contextual factors (e.g., deprivation and resources) likely eclipse the manager's ability to

affect the innovation cost-innovation adoption and innovation impact-innovation adoption relationships.

Sharma, Durand and Gur-Arie (1981, 292) propose a typology of moderator variables based on two dimensions: (1) whether or not the moderator variable is related to the dependent variable and (2) whether or not the moderator variable interacts with the predictor variable. Three types of moderators emerge from this typology: (1) “pure moderator,” where the moderator is not related to the dependent variable and interacts with the independent variable; (2) “homogenizer,” where the moderator is not related to the dependent variable and does not interact with the independent variable; and (3) “quasi moderator,” where the moderator is related to the dependent variable and interacts with the predictor variable (Sharma, Durand, and Gur-Arie 1981).<sup>4</sup> Based on this typology, the hypothesized moderating relationship involving gender is of the pure moderator type, and the moderating relationships involving tenure, education, and pro-innovation attitude are of the quasi-moderator type.

Prior research notes differences in communication style, tolerance for ambiguity and change, and socialization between men and women (Hooijberg and DiTomaso 1996). For instance, women tend to evidence a leadership style that is more transformational than their male counterparts (Stetler 2002). Compared to male managers, female managers use a participative leadership style, are socialized to display care and consideration, and establish better rapport with organizational members (Eagly and Johnson 1990; Hooijberg and DiTomaso 1996). For example, female city managers tend to facilitate community relations and communication with citizens and elected officials (Fox and Schuhmann 1999), evidencing the strong stakeholder relations which are critical to innovation and technology diffusion (Brown 2003) and performance improvement (Berman and Wang 2000). These characteristics could positively influence the adoption of complex innovations because (1) as stated above, complexity represents the degree to which the innovation is difficult to understand and use by organizational members; and (2) complex innovations fail primarily in the post-adoption decision phase of the innovation process; and (3) the adoption process of complex innovations usually follows a multiple sequence rather than a unitary sequence pattern (Gopalakrishnan and Damanpour 1994)<sup>5</sup> requiring managers to show more tolerance in managing the innovation process. Thus,

H<sub>10</sub> Managers' gender will moderate the innovation complexity-innovation adoption relationship.

Managers' tenure will be more advantageous for the adoption of complex than simple innovations. Complex innovations require more skills in managing the adoption process, including creating a climate for innovation, integrating the innovation into existing organizational processes, maintaining a sense of urgency to enable successful implementation, and overcoming resistance to innovation and facilitating its use by organizational members (Daft 2001; Damanpour and Schneider 2006). A manager's tenure helps this process because it provides legitimacy and knowledge of how to accomplish tasks, manage political processes, and obtain desired outcomes (Kimberly and Evanisko 1981). More seasoned

4 The fourth cell of Shamra et al.'s 2 × 2 typology, when the moderator is not related to the dependent variable and does not interact with the independent variable, indicates lack of a moderating relationship. The presumed moderator variable could instead be a predictor variable (Sharma, Durand, and Gur-Arie 1981).

5 The unitary sequence pattern assumes that the adoption process is orderly and occurs in a linear sequence; the multiple sequence pattern assumes that the process is more random and the phases and the sequence of their occurrence cannot be predicted (Poole 1981; Schroeder et al. 2000; Van de Ven and Rogers 1988).



managers have undertaken different assignments, have developed greater breadth of contacts with peers and reports, are familiar with critical contingencies that may arise during the adoption process, and have the experience and skills to manage them (Finkelstein 1992; Mumford 2000). In public service organizations in particular, an internal environment may exist in which seniority is respected and rewarded; thus, as their true values and intent are well known among organizational members, experienced top administrators may effectively advocate for innovative programs that depart from existing practices (Damanpour and Schneider 2006).

H<sub>11</sub> Managers' tenure will moderate the innovation complexity-innovation adoption relationship.

As stated earlier, since the newness of innovation creates a sense of uncertainty, educated managers' greater ability to gain information to reduce uncertainty facilitates the adoption of innovation (Rogers 1995). We propose that higher levels of managers' education will particularly facilitate the adoption of complex innovations because their adoption creates a larger sense of uncertainty than the adoption of simple innovations. Educated managers may also have greater cognitive ability to handle the information processing associated with complex innovation and change (Young, Charns, and Shortell 2001). For example, higher education levels of hospital administrators is a predictor of their organization's adoption of total quality management, a complex set of innovations spanning organizational structure, human resource practices, and information systems (Young, Charns, and Shortell 2001).

H<sub>12</sub> Managers' education will moderate the innovation complexity-innovation adoption relationship.

We also propose that managers' pro-innovation attitude facilitates the adoption of complex innovations. Complex innovations require laying the social, technical, and intellectual groundwork acceptable to a wider spectrum of organizational units and members (Mumford 2000). Hence, compared to simple innovations, the adoption of complex innovations takes more time and includes more players. Building and maintaining networks of organizational connections and resolving conflicts among more units is time consuming, and top managers' enthusiasm may wane over time or may not trickle down sufficiently to commit all units and members to forge successful adoption (Damanpour and Schneider 2006). Managers with greater pro-innovation attitude are more likely to maintain their enthusiasm and continue to commit resources and motivate organizational members toward successful adoption of complex innovations.

H<sub>13</sub> Managers' pro-innovation attitude will moderate the innovation complexity-innovation adoption relationship.

## **METHODS**

### **Data Sources**

We used multiple sources of data. The data for innovation characteristics were collected from academic and practitioner experts in 2003 (details below). The data for other variables were obtained from two surveys administered by the International City/County Management Association (ICMA) in 1997: reinventing government (RG) and alternative service delivery (ASD). Both questionnaires were addressed to the City Manager or Chief

Administrative Officer. The ICMA is a professional organization that as part of its mission conducts frequent surveys on a variety of topics and issues from public service organizations in the United States (Streib, Slotkin, and Rivera 2001). Its sampling is broad, based on municipalities and counties meeting size or other selection criteria, and is not confined to ICMA members.

The RG data were collected by a questionnaire mailed twice to the city managers/chief administrative officers of 2,858 municipalities with populations of 10,000 or more, from which 1,276 (44.7 percent) responses were returned (Moon and deLeon 2001). The ASD data were collected by questionnaires mailed to managers/chief administrative officers of 4,952 municipalities (with populations of 10,000 or more) and counties (with population of 25,000 or more), from which 1,586 (32.0 percent) responded.<sup>6</sup> As the RG survey includes programs and practices that were instituted in the local governments in response to the NPM/RG reform movement, and the ASD survey includes some earlier but related programs and practices, we merged the two data sets to obtain a larger set of practices. Because the samples of RG and ASD surveys are not identical, the merged data set includes 725 local governments (municipalities only) that responded to both surveys. The combined data set's respondents are from 48 states (none from Alaska and Hawaii) spanning all regions of the United States. We checked for differences between organizations in the merged data set with those in the RG and ASD surveys and found no significant differences. For example, the means of "metro status" (urbanization) and "form of government" in the merged data set were not statistically different ( $p > .05$ ) from those in the RG and ASD data sets. Also, for the variables that we formed from the RG survey, the means of size, resources, and tenure were not statistically different ( $p > .05$ ) in the merged data set than those in the RG data set. Therefore, we concluded that the merged data set adequately represents the local governments in both the RG and ASD surveys.

## Measures

### *Innovation Adoption*

The two authors independently coded the ASD and RG questionnaires. Each sought to identify the programs and practices which reduce the size of local government by privatizing or contracting out its services, adopt private sector quality management techniques, and encourage cooperative activity, flexibility, and streamlining. In the first round, one coder developed a list of 26 practices, the second a list of 28; 21 practices were common. Following a procedure suggested by Bullock and Svyantek (1985), the coders discussed the inconsistencies and reexamined their coding until they reached consensus. This process resulted in the final list of 25 programs (see Appendix). The sum of the number of practices from this list that were implemented in each organization constitutes the measure of innovation adoption in that organization.<sup>7</sup>

6 The number of respondents and response rates for RG and ADS surveys are available at the ICMA website: <http://www.icma.org/upload/bc/attach/{78719B78-FC2A-4C6F-83E6-7CA072254A99}rlg1997web.pdf>; <http://www.icma.org/upload/bc/attach/{6261952E-0435-441D-8D32-17DD1D3481F1}asd1997web.pdf>.

7 The ASD data set includes two implementation choices ("not implemented" and "implemented"), and the RG data set includes three choices ("not implemented," "sometimes implemented," and "always implemented"). We considered as "implemented" the practices from the ASD data set marked as "implemented" and those from the RG data set that were marked as "always implemented." The range of the total number of implemented practices by organizations in the sample was between 0 and 20.

### **Innovation Characteristics**

Innovation characteristics were rated by a panel of academic and practitioner experts. We invited 47 experts and received usable feedback from 21 (10 academics and 11 practitioners). The academic experts were selected based on publication of their recent research on NPM and RG movements in academic journals (e.g., *American Review of Public Administration*, *Public Administration Review*, *Public Performance & Management Review*). The practitioner experts were randomly selected from the annual pool of approximately 15–20 recipients of the ICMA awards from 1997 to 2001.

The expert panel was asked to rate the characteristics of each of the 25 practices on a 5-point scale. “Innovation cost” was evaluated based on the relative financial expenditure associated with each new practice (less expensive = 1, more expensive = 5). “Innovation complexity” was rated by the relative difficulty of the implementation of each practice (less difficult = 1, more difficult = 5). “Innovation impact” was evaluated by the relative impact of each practice on local government performance (negative impact = 1, no impact = 3, positive impact = 5). The Cronbach’s alpha coefficients for innovation cost, complexity, and impact were 0.73, 0.81, and 0.89, respectively. The mean expert ratings for cost, complexity, and impact for each practice constitute that practice’s measure of the innovation attribute. The three measures of innovation characteristics for an organization were then calculated by the means of cost, complexity, and impact of the practices adopted by that organization.

### **Manager Characteristics**

Demographic and personal attributes of managers were obtained mainly from the RG data set. “Age” was measured by four categories (1 = 25–34, 2 = 35–49, 3 = 50–65, 4 = 65 or older). “Gender” is a dichotomous variable (0 = female, 1 = male). “Education” was measured by a 5-point scale (1 = less than 2 years of college; 2 = four-year college degree; 3 = MPA, MBA, or other graduate degrees; 4 = JD or equivalent; 5 = PhD or equivalent). “Tenure” was measured by the number of years the manager has served in his/her current position (1 = less than 2 years; 2 = 2–4 years; 3 = 5–9 years; 4 = 10–15 years; 5 = more than 15 years).

“Pro-innovation attitude” is a composite measure we derived by computing the mean of the manager’s responses to six items in the RG survey that reflect his/her attitude favoring competition and entrepreneurship in public services. The items were as follows: competition should be introduced in the delivery of government services; departments should bid against third-party contractors for government work; competition plays an important role in moderating the cost of services; local governments should be entrepreneurial; local governments should develop nontax revenue services; and there should be financial incentives for employees to be entrepreneurial.<sup>8</sup> These items are rated on a 5-point scale (1 = strongly disagree, 2 = disagree, 3 = no opinion, 4 = agree, 5 = strongly agree). The Cronbach’s alpha coefficient for this variable was 0.69. “Political orientation” was

<sup>8</sup> There are face similarities between these items and some of the practices; hence, pro-innovation attitude may influence a certain subset of innovations more than the others. To test this possibility, we measured two subsets of practices adopted by organizations: (1) “innovsimilar” is the sum of the number of practices 4, 9, 10, 11, 12, 19, and 20 and (2) “innovnonsimilar” is the sum of the number of the remaining 18 practices (see Appendix). Zero-order correlations between pro-innovation attitude with innovsimilar and innovnonsimilar were, respectively, 0.253 ( $p < .01$ ) and 0.267 ( $p < .01$ ). Neither is significantly different from the other nor are they different from the association between pro-innovation attitude and adoption of all the practices (.291,  $p < .01$ , table 1).

measured by a 5-point scale (1 = very conservative, 2 = moderately conservative, 3 = neutral, 4 = moderately liberal, 5 = very liberal).

### **Control Variables**

Institutional factors vary widely across public organizations and affect their capacity to innovate (Lonti and Verma 2003; Painter 2005; Sapat 2004). We controlled for six variables representing environmental (jurisdictional) and organizational conditions that have been employed as determinants of innovation in prior research. The environmental control variables are urbanization (Boyne et al. 2005), deprivation or economic status (Kearney, Feldman, and Scavo 2000; Moon and deLeon 2001), and population growth (Rivera, Streib, and Willoughby 2000; Walker 2008). The organizational control variables are resources or economic health (Kearney, Feldman, and Scavo 2000; Rivera, Feldman and Scavo 2000), unionization (Moon and deLeon 2001; Teske and Schneider 1994), form of government (Franzel 2008; Moon and deLeon 2001; Moon and Norris 2005), and organizational size (Boyne et al. 2005; Walker 2008).

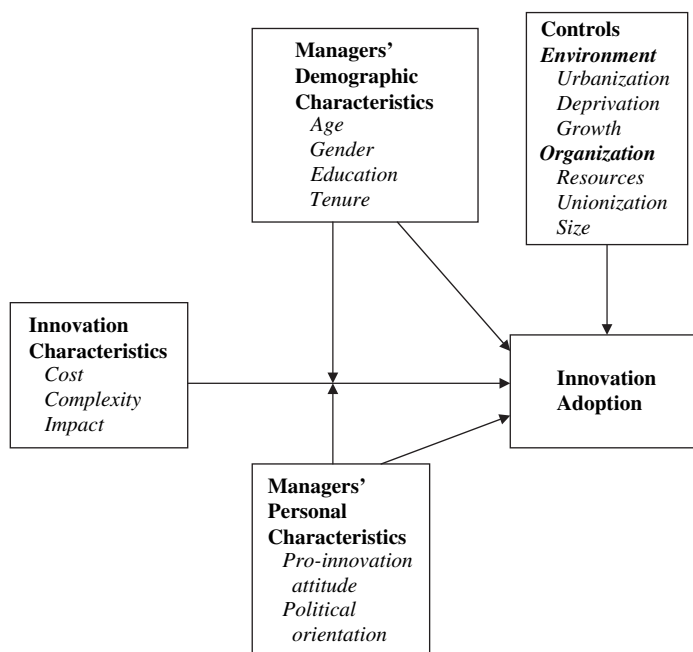
“Urbanization” was measured by whether the organization is located within a Metropolitan Statistical Area (MSA) as designated by the US Office of Management and Budget (1 = independent, city/county not located in MSA; 2 = suburban, city/county located in MSA; 3 = central, core city in an MSA). The remaining control variables were measured by the data from the surveys. “Deprivation” was measured by a 4-point scale reflecting the rate of unemployment in the local government’s jurisdiction (1 = under 3 percent, 2 = 3–4.9 percent, 3 = 5–7 percent, 4 = greater than 7 percent). “Growth” of population was measured using a 5-point scale (–2 = decreased more than 10 percent, –1 = decreased between 1–10 percent, 0 = stayed the same, 1 = increased between 1–10 percent, 2 = increased more than 10 percent). “Resources” was measured by the organization’s economic health on a 5-point scale (1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent). “Unionization” was measured by the percentage of the workforce that is unionized (0 = no union, 1 = less than 25 percent, 2 = 25–50 percent; 3 = 50–75 percent, 4 = more than 75 percent). “Mayor” is a dichotomous variable (1 = existence of a mayor, 0 = otherwise). *Size* was measured by the number of full-time employees on a 7-point scale (1 = fewer than 50, 2 = 50–99, 3 = 100–249; 4 = 250–499, 5 = 500–749, 6 = 750–999, 7 = 1000 or more). Figure 2 shows the study’s operational model.

### **RESULTS**

Table 1 shows descriptive statistics and correlation coefficients for all variables. We conducted hierarchical regression analyses entering control variables, innovation characteristics, and managers’ demographic and personal characteristics, respectively (table 2). We mean-centered the continuous predictor variables to reduce occurrence of multicollinearity in the moderating analysis (Aiken and West 1991). In testing for the effects of multicollinearity using variance inflation factors, these factors for all the models in table 2 were between 1.00 and 1.28, less than the threshold value of 10, indicating that multicollinearity should not be a concern (Neter, Wasserman, and Kutner 1985, 392).

Model 1 (table 2), including only control variables, is statistically significant ( $p < .001$ ) indicating that urbanization ( $p < .01$ ), resources ( $p < .05$ ), and size ( $p < .001$ ) positively influence innovation adoption as expected. These results imply that local governments in urban areas have complex environments that may stimulate innovation (Daft 2001), high

**Figure 2**  
Operational Model



population growth might provide local governments an increasing tax base that helps investment in innovation (Damanpour and Schneider 2006), and large size provides organizations better economies of scale to adopt innovation (Hitt, Hoskisson, and Ireland 1990; Nord and Tucker 1987). That is, regardless of their managers, **local governments that are sophisticated and large adopted more innovations than rural and small governments, which due to their fiscal and institutional constraints, adopt new practices in a more selective manner** (Choudhury 2007). Model 1 also shows that the existence of a mayor negatively ( $p < .001$ ) affects innovation adoption, suggesting that a dominant elected political authority constrains the ability of non-elected organizational leaders to innovate.<sup>9</sup>

Deprivation, growth, and unionization did not affect innovation adoption. Previous research suggests that environmental health positively (and deprivation negatively) affects innovation in public organizations (de Lancer Jules and Holzer 2001; Moon and deLeon 2001; Walker and Boyne 2006). Lack of a negative relationship may suggest that our measure (unemployment rate) alone does not fully represent deprivation, and more complex measures including both social and economic needs should be employed (Walker and Boyne 2006). Population growth is expected to positively affect innovation, but the results suggest a nonsignificant ( $p > .05$ ) impact. This result may highlight the following two

<sup>9</sup> We are grateful to an anonymous reviewer who recommended controlling for political authority.

**Table 1**  
Descriptive Statistics and Correlations

	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Innovation adoption	7.40	4.23																
2. Urbanization	1.96	0.61	<b>.19</b>															
3. Deprivation	2.07	0.89	−.03	−.07														
4. Growth	1.12	0.94	<b>.14</b>	<b>.04</b>	− <b>.10</b>													
5. Resources	3.59	1.02	<b>.13</b>	<b>.05</b>	− <b>.39</b>	<b>.22</b>												
6. Unionization	2.03	1.53	<b>.02</b>	<b>.16</b>	<b>.07</b>	− <b>.19</b>	− <b>.09</b>											
7. Mayor	0.17	0.39	− <b>.16</b>	−.03	− <b>.10</b>	−.06	<b>.02</b>	<b>.03</b>										
8. Size	3.61	1.36	<b>.27</b>	<b>.39</b>	<b>.09</b>	<b>.08</b>	<b>.01</b>	<b>.06</b>	−.01									
9. Cost	2.59	0.17	<b>.27</b>	<b>.06</b>	−.05	<b>.01</b>	<b>.09</b>	−.02	−.03	−.03								
10. Complexity	2.92	0.15	−.05	<b>.00</b>	<b>.03</b>	−.03	<b>.02</b>	<b>.05</b>	<b>.02</b>	<b>.02</b>	−.07							
11. Impact	3.87	0.17	<b>.19</b>	<b>.04</b>	−.02	−.01	<b>.05</b>	<b>.02</b>	−.04	−.04	<b>.71</b>	−.55						
12. Age	2.38	0.62	−.01	<b>.02</b>	<b>.01</b>	−.03	<b>.05</b>	−.02	<b>.07</b>	<b>.07</b>	<b>.02</b>	<b>.08</b>	−.01					
13. Gender	0.91	0.28	<b>.03</b>	<b>.00</b>	<b>.08</b>	<b>.05</b>	−.05	<b>.00</b>	− <b>.08</b>	−.02	<b>.01</b>	−.01	−.00	<b>.02</b>				
14. Education	2.72	0.59	<b>.13</b>	<b>.08</b>	−.00	<b>.05</b>	<b>.00</b>	<b>.06</b>	− <b>.15</b>	<b>.11</b>	− <b>.08</b>	<b>.00</b>	−.04	− <b>.16</b>	<b>.13</b>			
15. Tenure	2.71	1.25	<b>.13</b>	<b>.01</b>	−.05	<b>.04</b>	<b>.14</b>	−.03	−.02	−.01	<b>.02</b>	−.01	<b>.04</b>	<b>.26</b>	<b>.05</b>	−.05		
16. Pro-innovation attitude	3.89	0.54	<b>.29</b>	<b>.11</b>	−.05	−.02	<b>.04</b>	<b>.09</b>	−.04	<b>.13</b>	<b>.11</b>	<b>.10</b>	<b>.06</b>	−.06	<b>.01</b>	<b>.11</b>	−.06	
17. Political orientation	2.70	0.86	<b>.07</b>	<b>.05</b>	−.01	−.01	−.02	<b>.08</b>	−.05	<b>.05</b>	−.03	<b>.05</b>	−.02	−.03	− <b>.10</b>	<b>.10</b>	−.05	−.06

Note: *N* = 691–725; listwise *N* = 633. Bold correlations are significant (*p* < .05).

**Table 2**  
**Regression Models**

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
<b>Control variables</b>							
Urbanization	.112**	.099*	.108**	.084*	.093*	.075†	.081*
Deprivation	-.011	-.002	-.006	.004	-.001	.022	.018
Growth	.059	.070†	.064†	.062†	.056	.070†	.065†
Resources	.101*	.091*	.098*	.074†	.083*	.073†	.080*
Unionization	.018	.026	.017	.018	.011	-.003	-.011
Mayor	-.150***	-.142***	-.142***	-.126***	-.128***	-.111**	-.113**
Size	.214***	.211***	.213***	.209***	.212***	.176***	.178***
<b>Innovation characteristics</b>							
Cost		.243***		.245***		.212***	
Complexity		-.003		.014		.005	
Impact			.164***		.157***		.130***
<b>Manager characteristics</b>							
Age				-.140	-.164	-.107	-.127
Age <sup>2</sup>				.115	.141	.095	.118
Tenure				.528**	.538***	.468**	.495**
Tenure <sup>2</sup>				-.440**	-.455**	-.390*	-.402*
Education				.088*	.074†	.066†	.053
Gender				.006	.015	.011	.020
Pro-innovation attitude						.234***	.248***
Political orientation						.080*	.084*
Adjusted R <sup>2</sup>	.113***	.169***	.138***	.189***	.156***	.243***	.216***
Change in R <sup>2</sup>		.059***	.027**	.027**	.026**	.055***	.062***
F-value	12.448	15.284	13.653	10.808	9.331	12.902	11.914
Residual degrees of freedom	625	623	624	617	618	615	616

Note: Table entries are standardized regression coefficients.

†  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

competing arguments. On one hand, growth would have a positive effect as it may promise a larger tax base and motivate local governments to adopt new practices to increase the scope and quality of services. On the other hand, a declining tax base may motivate local governments facing low population growth to adopt new practices to increase the efficiency of internal processes and delivery of services (Damanpour and Schneider 2006). Finally, although employee unions are generally expected to hurt innovation (de Lancer Julnes and Holzer 2001; Fennell 1984; Wise 1999), our nonsignificant result may suggest that perhaps unions have a stronger negative effect on managers' "innovation adoption decision" than on organizations' "innovation implementation," which require contributions and commitments of both managers and nonmanagers (Damanpour and Schneider 2006).

Because innovation impact was highly correlated with both innovation cost and innovation complexity ( $r = .71$  and  $-.51$ , respectively, table 1), we used two models to analyze the influence of innovation characteristics: innovation cost and complexity were added in model 2, and innovation impact was entered in model 3 (table 2). The addition

of innovation characteristics increased the explanatory power of the model as changes in *R*-squared in both models 2 and 3 over model 1 are statistically significant ( $p < .01$ ). The addition of top administrators' demographic attributes (models 4 and 5) and personal attributes (models 6 and 7) also improved the predictability of the models, as changes in *R*-squared were significant in models 4 and 5 ( $p < .01$ ) and models 6 and 7 ( $p < .001$ ) (table 2).

We then tested the interaction effects (data not shown), including all possible interactions between innovation cost, complexity, and impact with the six manager characteristics. The addition of the interaction effects (whether hypothesized or not) did not improve the fit of the models, as changes in *R*-squared were not significant at the .05 level in any of the interaction models (details below).

Hypotheses 1 and 2, which suggested that innovation cost and complexity negatively affect innovation adoption, were not supported. Innovation complexity did not have a significant effect ( $p > .05$ ), and innovation cost had a positive effect ( $p < .001$ ) (model 2). These unexpected findings could be attributed to the type of innovation (administrative and incremental) examined in this study (details below). Hypothesis 3, which suggested that innovation impact will positively affect innovation adoption, was supported as the regression coefficient for impact was positive and significant (model 3,  $p < .001$ ).

Hypotheses 4–7 proposed associations between managers' demographic characteristics and innovation adoption. Hypotheses 4 and 5 proposed an inverted U-shaped effect for age and tenure. Whereas the regression coefficients were not significant for *age* and *age*<sup>2</sup> (models 4 and 5,  $p > .05$ ), they were positive ( $p < .001$ ) and negative ( $p < .001$ ) for *tenure* and *tenure*<sup>2</sup>, respectively, supporting Hypothesis 5. Hypotheses 6 was partially supported as the coefficient for education was positive in model 4 ( $p < .05$ ) but weakly positive in model 5 ( $p < .10$ ). Hypothesis 7 was supported as gender did not have a significant effect (models 4 and 5,  $p > .05$ ).

Hypotheses 8 and 9 dealt with the impact of managers' personal characteristics. Hypothesis 8 was supported as pro-innovation attitude was positively related to innovation adoption in both models 6 and 7 ( $p < .001$ ). Hypothesis 9, which proposed that managers' political orientation will not significantly affect innovation adoption, was not supported. Instead, we found that manager's liberal ideology had a positive effect ( $p < .05$ ) in both models 6 and 7. This finding suggests that the change orientation and flexibility associated with managers with liberal ideology are more beneficial to innovation adoption than spending control and efficiency inclinations associated with managers with conservative ideology (Moon and deLeon 2001).

Hypotheses 10–13 proposed that four manager characteristics will interact with innovation characteristics. None of these hypotheses were supported. From the tests of 18 possible moderating effects (six manager characteristics  $\times$  three innovation characteristics), we found only one significant interaction effect (education  $\times$  innovation cost positively affected innovation adoption,  $\beta = .372$ ,  $p < .05$ ). However, addition of the interactions did not increase the explanatory power of the models over models 6 and 7, as the changes in *R*-squared were not significant ( $p > .05$ , data not shown) in any of the 18 models.

In summary, the findings suggest that after controlling for several key environmental and organizational factors, innovation characteristics play an important role in determining innovation adoption. Manager characteristics, especially managers' personal characteristics, have significant direct effects, but they do not moderate the influence of innovation attributes on innovation adoption. We discuss the implications of these findings for research and practice in the next section.



## DISCUSSION

Extensive research has been conducted on innovation and innovation adoption. Although some researchers (Berry 1994; Boyne et al. 2005; Damanpour and Schneider 2006; Roberts and King 1989; Walker 2008) have studied innovation in the public sector, the main thrust of research has been in the private sector. In light of differences in ownership, source of funding, and relative reliance on political control versus market forces between the two sectors (Perry and Rainey 1988), more academic research on both the antecedents and consequences of innovation in the public sector is needed. This study adds to the growing literature on innovation in public organizations by focusing on the roles of innovation characteristics and public managers' discretion on the adoption of innovation.

### The Role of Innovation Characteristics

The results indicate that innovation characteristics increase the predictability of innovation adoption beyond the influence of environmental and organizational factors (models 2 and 3 vs. model 1, table 2). Considering the effect of each innovation attribute alone, the findings for innovation impact support previous research (Tornatzky and Klein 1982; Rogers 1995) as regression coefficients were consistently positive for this attribute (models 3, 5, and 7, table 2). However, contrary to our expectation, we found innovation cost had a positive, and innovation complexity had a nonsignificant, association with innovation adoption (models 2, 4, and 6, table 2).<sup>10</sup>

Three possible explanations can be offered for these findings. First, research on antecedents of innovation adoption has generally examined a small number of innovations. For instance, as stated earlier, theories of innovation characteristics were mainly developed for the adoption of a single innovation by individual adopters (Rogers 1995). Tornatzky and Klein (1982) reported that only 25 percent of the studies in their meta-analysis of the innovation attribute-innovation adoption relationship included more than 10 innovations. Our study includes 25 innovations, a relatively large number of innovations compared with prior empirical studies. Reviews of the antecedents of innovation adoption suggest that research results differ between studies that focus on the adoption of few versus many innovations (Camison-Zornoza et al. 2004; Damanpour 1991). Hence, it is possible that the influence of some innovation characteristics in our study do not follow the same pattern as offered in previous research based on the adoption of few innovations. According to Damanpour's (1991, 578) quantitative review of empirical studies, the studies that included a large number of innovations provided more robust results than the studies that used a small number of innovations. Therefore, our findings may suggest that public managers use their discretion in selecting from an array of innovations and tend to give greater weight to the criterion of greater impact than to lower cost or less complexity. This implies that public managers might have a long-term orientation in stressing benefit or effectiveness over cost minimization or relative ease in innovation adoption, which might be aligned with the "commitment to public service" dimension of public service managers' motivation (Perry 1996).

<sup>10</sup> It should be noted that although innovation cost has generally been hypothesized to have a negative relationship with innovation adoption, the empirical results have been mixed (Tornatzky and Klein 1982). Further, both cost and complexity of innovations in this study received low ratings from the expert panel (mean ratings for cost and complexity of the 25 practices were, respectively, 2.59 and 2.92, table 1).

Second, the innovation characteristic-innovation adoption results may have been influenced by the type of innovation we studied. Most theories of innovation have been developed based on studies of technical innovations, especially innovations that have been developed through an organization's R&D activities (Gallouj and Weinstein 1997; Meeus and Edquist 2006; Miles 2005). The innovations included in this study are administrative, not technical. Administrative innovations pertain to organizational structure, administrative processes, and human resources (Daft 1978; Gopalakrishnan and Damanpour 1994; Kimberly and Evanisko 1981; Walker 2006). Innovation scholars have argued that the antecedents and processes of the adoption of technical and administrative innovations are different (Bantel and Jackson 1989; Kimberly and Evanisko 1981; Subramanian and Nilakanta 1996; Walker 2006). For instance, Daft (1978, 2001) argues that technical innovations are initiated primarily in the operational core and follow a bottom-up adoption process, whereas administrative innovations are mainly initiated in the administrative core and follow a top-down adoption process. From a socio-technical systems perspective, Damanpour and Evan (1984) argue that technical innovation are directly related to the primary work activity of the organization (e.g., innovations in products, services, and production processes), but administrative innovations are indirectly related to the primary work activity and are more directly related to management (e.g., innovations in structure, management processes, reward systems). As such, administrative innovations might be less costly and less complex to adopt in public organizations than technical innovations.

Third, the association between innovation attributes and innovation adoption can also be influenced by the radicalness of innovation. Innovation researchers have discussed differences in the antecedents and outcomes of radical versus incremental innovations (Ettlie, Bridges, and O'Keefe 1984; Germain 1996; He and Wong 2004). Whereas radical or exploratory innovations are major deviations from the organization's current programs and practices and often require recombination of more specialized and diverse ideas and information, incremental or exploitative innovations are only minor departures from the existing practices and are usually easier to develop and implement (Damanpour 1991; He and Wong 2004; March 1991). The administrative innovations studied here are primarily incremental, as public service organizations, like organizations in other branches of the service sector, are often adopters of innovations developed in the other industries (e.g., the adoption of IT developed in the computer and communication industries in commercial banks; the adoption of quality management techniques developed in the private sector in local governments) (Barras 1990; Damanpour and Wischnevsky 2006; Miles 2005). Hence, incremental innovations in our sample might be less complex and less costly to adopt than more radical innovations examined in prior studies.

These explanations suggest need for more finely grained research on the influence of innovation characteristics on innovation adoption in public organizations. This study largely focused on incremental administrative innovations. Future research could contribute by comparing and contrasting the differences in the innovation characteristic-innovation adoption relationship for types of innovation (product/service, technological process, administrative), innovation radicalness (radical, incremental), or both.

### **Managerial Discretion in Public Organizations**

Much theorizing has occurred regarding distinctions between the public and private sectors. Public-private distinctions include ownership, funding, and greater reliance on political

control mechanisms in the public sector and on markets in the private sector (Perry and Rainey 1988). The NPM/RG reform movement, which promotes the adaptation and use of private sector practices in public service organizations, might blur the distinctions. Yet, recent research indicates that the convergence thesis of private sector influence on the public sector is over-stated; differences between the sectors remain and some private-sector practices have been affected by those in the public sector (Poole, Mansfield, and Gould-Williams 2006). Because study of organizations should take into account their institutional embeddedness (Noordegraaf and Stewart 2000), we assume that institutional distinctions could affect innovation adoption in public organizations and interpret our results on managerial discretion in this light. We put forth that the role of public managers in promoting innovation is likely similar to their role in promoting change or in entrepreneurship: they utilize social influence to affect others' opinions, attitudes, and behaviors; empower and mobilize organizational members rather than impose on them; and engage their organizations in a systemic or holistic process of change rather than merely a top-down process (Bernier and Hafsi 2007; Kelman 2005).

Forces related to environmental factors such as growth and political/legal constraints and organizational factors such as structure and culture might limit the discretion of managers (Daft 2001; Hambrick and Abrahamson 1995; Hambrick and Finkelstein 1987). First, public managers face great scrutiny and disclosure, and their discretion is limited by elected officials and voter mandates (Nutt 2000). The negative effect of the existence of a mayoral form of government in this study (table 2) may illustrate the constraints of a dominant elected political authority on public managers, supporting that the cooperative nature of the city manager form of government encourages government reform and innovation (Moon and deLeon 2001; Syara 1990). Yet, we note that a recent study has found no effect of form of government on the adoption of various innovations (Moon and Norris 2005), and political and cultural factors may play a larger role in innovation implementation—the phase included in our study—than in the adoption policy decision (de Lancer Julnes and Holzer 2001). Second, unlike private sector managers who often have the ability to compete for desirable markets, public sector managers tend to have an obligation to serve a particular area (Nutt 2000). Given their obligation to serve, public managers must sometimes reckon with deleterious environmental factors such as negative growth or deprivation rather than enter a more attractive environment. Third, public organizations often remain more bureaucratic than private sector organizations (Boyne 2002), and their greater reliance on rules and procedures will limit public managers' discretion.

But although public managers have tended to operate within the confines of programmed decisions and imposed agendas (Kaufman 1981), the government reinvention movement has resulted in an increase in managerial discretion (DeLeon 1998), prompting the question of the impact of environmental and organizational forces and the degree of managerial discretion in our study. For instance, whereas the results suggest that several external and internal factors (urbanization, resources, and size) significantly influence innovation adoption, others (deprivation, growth, and unionization) do not. We also found that public managers' personal characteristics of pro-innovation attitude and liberal orientation significantly increased the explanatory power of the models (table 2, models 6 and 7), suggesting that effective leaders can institute organizational cultures that facilitate change and thus influence organizational outcomes (Hennessey 1998).

Our finding regarding public managers' pro-innovation attitude is consistent with empirical evidence from innovation research (Damanpour 1991). However, the result regarding

public managers' liberal orientation and the adoption of administrative innovations, while in agreement with the finding of Moon and deLeon (2001), it is in contrast with the results of Brudney, Hebert, and Wright (1999). A possible explanation is that the political orientation of elected officials and/or the local electorate, rather than public managers' political orientation, would influence innovation in local governments. However, empirical evidence from privatization studies (i.e., an administrative innovation adoption decision regarding outsourcing of public services to for-profit organizations) is mixed. For example, whereas Lopez-de-Silanes et al. (1997) found that conservative ideology (measured by the percentage of county votes for a Republican governor) positively affects privatization, Levin and Tadelis (forthcoming) found that cities located in counties that voted Republican in the 2000 presidential election were less likely to privatize public services. Hence, further research is needed to examine the issue of political orientation. Possible directions are the examination of (1) conflict in political orientation between the mayor/electorate and the city/county manager and (2) interactive effect of managers' and elected officials'/electorates' political orientation on innovation adoption in public organizations.

The results of this study also indicate that the contribution of managers' demographic characteristics toward explanation of variance in innovation adoption is far less than managers' personal characteristics (table 2, models 4–7). This finding supports critique of reliance on demographics characteristics as proxies for psychosocial constructs (Boal and Hooijberg 2000; Carpenter, Geletkanycz, and Sanders 2004; Priem, Lyon, and Dess 1999). We found that managers' education positively affects innovation, supporting the finding that through greater education, managers' enhanced expertise and intellectual capacity benefit innovation in organizations (Kearney, Feldman, and Scavo 2000). Tenure had a nonlinear effect, intimating that managerial experience positively affects the adoption of innovation until the point where it diminishes a manager's willingness to change the existing organizational practices and routines to which he/she has become accustomed. Our nonlinear result differs from the positive relationship found by Kearney, Feldman, and Scavo (2000) perhaps because our sample includes city managers with a wider range of tenure, allowing a broader test the relationship. The inverted U-shaped relationship also suggests that public organizations remain somewhat bureaucratic in placing great emphasis on the legitimacy of managerial experience while in some cases suffering from the disadvantage of managerial rigidity or inertia. Managers' tenure reflects stability and security, which are among the most highly ranked motivational forces among public employees (Jurkiewicz, Massey, and Brown 1998). But we found that employee unionization, which also represents stability and security, does not affect innovation adoption, and Lonti (2005) found no effect for employee seniority. These findings suggest lack of bureaucratic tendency for nonmanagers, offering an opposing view of the role of bureaucracy for innovation adoption. Hence, further research is needed to tease out the impact of bureaucratic tendencies in terms of managers' tenure versus organizational members' tenure and unionization on innovation adoption in public organizations.

### **Limitations, Implications, and Conclusion**

Our study has several limitations that should be considered in interpreting its results. First, although we have included a sizable number of variables in our study, inclusion of more environmental, organizational, and managerial factors, and additional innovation attributes, would likely reduce error variance in the study and provide a more realistic explanation of the

relationship between innovation characteristics and innovation adoption. Second, we have not accounted for the influence of prior innovation adoption because our study is cross-sectional. Future longitudinal studies could provide a richer understanding of the adoption of innovation over time. Third, although we used data from multiple sources and there are few high correlations among the variables developed from the ICMA surveys, both surveys rely on the ratings provided by a single respondent. Surveys relying on multiple informants are preferred to those using single informants because they are more likely to capture internal organizational variety (Walker and Enticott 2004). Fourth, innovation characteristic data was drawn from a relatively small expert panel rather than a large survey. Yet we note that reliance on expert panels is common among innovation studies (e.g., Dewar and Dutton 1986; Gopalakrishnan and Damanpour 2000; Nystrom, Ramamurthy, and Wilson 2002) and our 21-member panel falls well within the guidelines that generally suggest a panel of 12 experts (Ashton 1986; Hogarth 1978). Fifth, the data represents US local governments in 1997, suggesting that caution be applied regarding the external validity of the study to public service organizations in other countries and later stages of the NPM/RG reform movement.

Although our test did not reveal moderating relationships, we only tested the moderating role of manager characteristics. The effort to identify moderating variables may continue by testing for other moderators (e.g., nonmanagerial or organizational factors). We also recommend future studies of innovation adoption at later stages of the NPM/RG movement, especially longitudinal studies that include both its early and later stages. As many recent studies of public sector innovation have taken place in the United States and United Kingdom, there is need for studies in non-Anglo contexts, as socio-cultural context influences innovation in terms of inquisitiveness and tolerance for change (Elenkov and Manev 2005; Hofstede 2001), particularly regarding administrative innovations (Hoffman and Haggerty 1993). Moreover, the US (Damanpour and Schneider 2006; Kearny, Feldman, and Scavo 2000; Moon and deLeon 2001; Rivera, Streib, and Willoughby 2000) and UK (those of Boyne, Walker and colleagues) studies of public sector innovation are mainly on local governments. We recommend the study of mezzo-level government such as states and provinces, as innovation adoption processes might vary with government level. Last, we suggest research which contrasts the differences and similarities between innovation adoption in the public and private sectors, as our finding regarding both innovation and manager characteristics might contrast with tendencies in the private sector.

In conclusion, despite its limitations, our study makes several important contributions. It is among the rare multi-innovation, large sample studies that examine the relationship between innovation attributes and its adoption. It also examines the direct and moderating roles of public managers' characteristics and shows that personal characteristics play a more crucial role in the adoption of innovation than demographic characteristics. Some of its findings, for example, that innovation cost and complexity do not inhibit innovation adoption highlight the importance of distinguishing between innovation types and radicalness, and between private and public organizations, in developing theories of innovation in organizations. The study's findings point to comparative studies that need to be conducted for developing more robust theories of innovation in organizations and a better understanding of the complex process of innovation adoption.

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## APPENDIX 1

Mean and Standard Deviation of Expert Ratings of Innovation Cost, Complexity, and Impact

	Cost		Complexity		Impact	
	Mean	s.d.	Mean	s.d.	Mean	s.d.
Relationships with constituents						
1. Customer service training for employees	2.65	0.93	2.10	1.00	4.29	0.64
2. Decision-making training for neighborhood organizations	2.88	1.09	3.11	1.28	3.67	0.77
3. Decision-making training for employees regarding response to citizen complaints	2.85	0.75	2.43	1.16	4.33	0.66
4. Using funds for employee incentives	3.30	0.98	3.57	1.50	3.86	0.85
5. Using citizen surveys to determine their expectations and satisfaction	3.53	1.02	2.70	1.34	4.25	0.85
Financing						
6. Increasing the fee of certain services rather than increasing taxes	2.25	1.16	3.24	1.00	3.40	0.75
7. Changing the budget format to fund outcomes, not inputs	2.80	0.95	4.00	1.05	4.29	0.78
8. The use of enterprise funds	2.16	0.90	2.75	1.07	3.50	0.76
9. Creating nontax revenue through the sale of government data: traditional means or online	2.00	0.77	2.61	1.14	3.26	0.93
10. Creating nontax revenue through the sale of government memorabilia	1.83	0.86	2.32	1.00	2.74	0.93
11. Creating nontax revenue through the sale of franchises for the use of rights-of-way	1.95	0.71	2.95	1.35	3.21	1.03
12. Funding programs that make municipal government more entrepreneurial	2.63	0.83	3.30	1.17	4.00	0.86
Service delivery						
13. Establishing a citizens' advisory committee on private service delivery alternatives	2.06	1.12	2.72	1.32	3.28	1.23
14. Applying private alternatives to new services	2.61	0.70	2.95	1.07	3.80	0.89
15. Applying private alternatives to growing services	2.68	0.67	3.05	1.12	3.85	0.88
16. Systematically evaluating private service delivery in terms of citizen satisfaction	2.95	0.91	2.81	1.12	4.24	0.62
17. Systematically evaluating private service delivery in terms of cost	2.84	0.83	2.71	1.15	4.33	0.66
18. Systematically evaluating private service delivery in terms of compliance with contract standards	2.79	0.92	2.76	1.22	4.33	0.66
Governance and structure						
19. Contracting out of a program or service to a third party	2.75	1.07	3.24	1.00	3.70	0.66
20. Partnering with a third party to provide a program or service	2.40	0.88	3.19	1.03	3.70	0.73
21. Allowing government departments to compete with the private sector in the bidding process	2.72	1.07	3.50	1.15	4.11	0.76
22. Developing a nonprofit subsidiary	2.63	0.89	3.56	1.38	3.41	1.00
23. Developing a for-profit subsidiary	2.85	1.07	4.00	1.37	2.94	1.24
24. Developing an interlocal service agreement or joint powers agreement	2.40	0.60	3.00	1.30	3.90	0.91
25. Developing a local or national cooperative purchasing agreement	2.32	0.67	3.10	1.29	3.90	1.12

**REFERENCES**

- Aiken, Leona S., and Stephen G. West. 1991. *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Teresa M. Amabile. 1988. A model of creativity and innovation in organizations. In *Research in organizational behavior*, eds. L. L. Cummings and B. M. Staw, 10:123–67.
- Robert H. Ashton. 1986. Combining the judgments of experts: How many and which ones? *Organizational Behavior and Human Decision Processes* 38:405–14.
- Bantel, Karen A., and Susan E. Jackson. 1989. Top management and innovations in banking: Does the composition of the top management team make a difference. *Strategic Management Journal* 10 (S): 107–24.
- Baron, Reuben M., and David A. Kenny. 1986. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology* 51 (6): 1173–82.
- Barras, Richard. 1990. Interactive innovation in financial and business services: The vanguard of the service revolution. *Research Policy* 19:215–37.
- Bass, Bernard M. 1990. *Bass and Stogdill's handbook of leadership: Theory, research, and managerial application*. New York: Free Press.
- Berman, Evan, and XiaoHu Wang. 2000. Performance measurement in US counties: Capacity for reform. *Public Administration Review* 60 (5): 409–20.
- Bernier, Luc, and Taieb Hafsi. 2007. The changing nature of public entrepreneurship. *Public Administration Review* 67 (3): 488–503.
- Berry, Frances S. 1994. Innovation in public management: The adoption of strategic planning. *Public Administration Review* 54 (4): 322–30.
- Berry, Frances S., William D. Berry, and Stephen K. Foster. 1998. The determinants of success in implementing an expert system in state government. *Public Administration Review* 58 (4): 293–305.
- Boal, Kimberly B., and Robert Hooijberg. 2000. Strategic leadership research: Moving on. *The Leadership Quarterly* 11 (4): 515–49.
- Borins, Sanford. 2000. Loose cannons and rule breakers, or enterprising leaders? Some evidence about innovative public managers. *Public Administration Review* 60 (6): 498–507.
- Box, Richard C. 1999. Running government like a business: Implications for public administration theory and practice. *American Review of Public Administration* 29 (1): 19–43.
- Boyne, George A. 2002. Public and private management: What's the difference? *Journal of Management Studies* 39 (1): 97–122.
- Boyne, George A., Catherine Farrell, Jennifer Law, Martin Powell, and Richard M. Walker. 2003. *Evaluating public management reforms: Principles and practice*. Buckingham: Open Univ. Press.
- Boyne, George A., Julian S. Gould-Williams, Jennifer Law, and Richard M. Walker. 2005. Explaining the adoption of innovation: An empirical analysis of public management reform. *Environment and Planning: Government and Policy* 23 (3): 419–35.
- Brown, Mary M. 2003. Technology diffusion and the “knowledge barrier”. *Public Performance & Management Review* 26 (4): 345–59.
- Brudney, Jeffrey L., F. Ted Hebert, and Deil S. Wright. 1999. Reinventing government in the American states: Measuring and explaining administrative reform. *Public Administration Review* 59 (1): 19–30.
- Bullock, R.J., and Daniel J. Svyantek. 1985. Analyzing meta-analysis: Potential problems, an unsuccessful replication, and evaluation criteria. *Journal of Applied Psychology* 17:108–15.
- Carpenter, Mason A., Marta A. Geletkanycz, and Wm Gerard Sanders. 2004. Upper echelon research revisited: Antecedents, elements, and consequences of top management composition. *Journal of Management* 30:749–78.
- Camison-Zornoza, Cesar, Rafael Lapiedra-Alcami, Mercedes Segarra-Cipres, and Montserrat Boronat-Navarro. 2004. A meta-analysis of innovation and organizational size. *Organization Studies* 25: 331–61.
- Choudhury, Emamul H. 2007. Workforce planning in small local governments. *Review of Public Personnel Administration* 27 (3): 264–80.

- Daft, Richard L. 1978. A dual-core model of organizational innovation. *Academy of Management Journal* 21:193–210.
- Daft, Richard L. 2001. *Organization theory and design*. Cincinnati, OH: South-Western.
- Damanpour, Fariborz. 1991. Organizational innovation: A meta-analysis of effects of determinants and moderators. *Academy of Management Journal* 34:555–90.
- Damanpour, Fariborz, and William M. Evan. 1984. Organizational innovation and performance: The problem of “organizational lag”. *Administrative Science Quarterly* 29:392–409.
- Damanpour, Fariborz, and Marguerite Schneider. 2006. Phases of the adoption of innovation in organizations: Effects of environment, organization, and top managers. *British Journal of Management* 17:215–36.
- Damanpour, Fariborz, and J. Daniel Wischnevsky. 2006. Research on organizational innovation: Distinguishing innovation-generating from innovation-adopting organizations. *Journal of Engineering and Technology Management* 23:269–91.
- de Lancer Julnes, Patricia, and Marc Holzer. 2001. Promoting the utilization of performance measures in public organizations: An empirical study of factors affecting adoption and implementation. *Public Administration Review* 61 (6): 693–708.
- DeLeon, Linda. 1998. Accountability in a “reinvented” government. *Public Administration* 76:539–58.
- Dewar, Robert D., and Jane E. Dutton. 1986. The adoption of radical and incremental innovations: An empirical analysis. *Management Science* 32:1422–33.
- DiTomaso, Nancy, and George Farris. 1992. Diversity and performance in R&D. *IEEE Spectrum* 29 (6): 21–4.
- Downs, George W., Jr., and Lawrence B. Mohr. 1976. Conceptual issues in the study of innovation. *Administrative Science Quarterly* 21:700–14.
- Drucker, Peter F. 1985. The discipline of innovation. *Harvard Business Review* 63 (3): 67–72.
- Eagly, Alice H., and Blair T. Johnson. 1990. Gender and leadership style: A meta-analysis. *Psychological Bulletin* 108:233–56.
- Elenkov, Detelin S., William Judge, and Peter Wright. 2005. Strategic leadership and executive innovation influence: An international multi-cluster comparative study. *Strategic Management Journal* 26: 665–82.
- Elenkov, Detelin S., and Ivan M. Manev. 2005. Top management leadership and influence on innovation: The role of socio-cultural context. *Journal of Management* 31 (3): 381–402.
- Ettlie, John E., William P. Bridges, and Robert D. O’Keefe. 1984. Organization strategy and structural differences for radical versus incremental innovation. *Management Science* 30:682–95.
- Fennell, Mary L. 1984. Synergy, influence and information in the adoption of administrative innovations. *Academy of Management Journal* 27 (1): 113–29.
- Finkelstein, Sydney. 1992. Power in top management teams: Dimensions, measurement, and validation. *Academy of Management Journal* 35:505–38.
- Fishbein, Martin, and Icek Ajzen. 1972. Attitudes and opinions. *Annual Review of Psychology* 23: 487–544.
- Fliegel, Frederick C., and Joseph E. Kivlin. 1966. Attributes of innovations as factors in diffusion. *American Journal of Sociology* 72 (3): 235–48.
- Fox, Richard L., and Robert A. Schuhmann. 1999. Gender and local government: A comparison of women and men city managers. *Public Administration Review* 59 (3): 231–42.
- Franzel, Joshua M. 2008. Urban government innovation: Identifying current innovations and factors that contribute to their adoption. *Review of Policy Research* 25 (3): 253–77.
- Gallouj, Faiz, and Oliver Weinstein. 1997. Innovation in services. *Research Policy* 26:537–56.
- Germain, Richard. 1996. The role of context and structure in radical and incremental logistics innovation adoption. *Journal of Business Research* 35:117–27.
- Gianakis, Gerasimos A., and Clifford P. McCue. 1997. Administrative innovation among Ohio local government finance officers. *American Journal of Public Administration* 27 (3): 270–86.
- Gopalakrishnan, Shanthi, and Fariborz Damanpour. 1994. Patterns of generation and adoption of innovations in organizations: Contingency models of innovation attributes. *Journal of Engineering and Technology Management* 11:95–116.



- Gopalakrishnan, Shanthi, and Fariborz Damanpour. 2000. The impact of organizational context on innovation adoption in commercial banks. *IEEE Transactions on Engineering Management* 47:14–25.
- Hage, Jerald, and Robert Dewar. 1973. Elite values versus organizational structure in predicting innovation. *Administrative Science Quarterly* 18:279–90.
- Hambrick, Donald C., and Eric Abrahamson. 1995. Assessing managerial discretion across industries: A multimethod approach. *Academy of Management Journal* 38 (5): 1427–41.
- Hambrick, Donald C., and Sydney Finkelstein. 1989. Managerial discretion: A bridge between polar views of organizational outcomes. *Research in Organizational Behavior* 9:369–406.
- Hambrick, Donald C., and Phyllis A. Mason. 1984. Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review* 9:193–206.
- He, Zi-Lin, and Poh-Kam Wong. 2004. Exploration vs. exploitation: An empirical test of the ambidexterity hypothesis. *Organization Science* 15:481–94.
- Hennessey, J. Thomas, Jr. 1998. “Reinventing” government: Does leadership make the difference? *Public Management Review* 58 (6): 522–32.
- Hitt, Michael A., Robert E. Hoskisson, and R. Duane Ireland. 1990. Mergers and acquisitions and managerial commitment to innovation in M-form firms. *Strategic Management Journal* 11 (S): 29–47.
- Ho, Alfred Tat-Kei. 2002. Reinventing local governments and the e-government initiative. *Public Administration Review* 62 (4): 434–44.
- Hoffman, Richard C., and W. Harvey Hegarty. 1993. Top management influence on innovations: Effects of executive characteristics and social culture. *Journal of Management* 19:549–74.
- Hofstede, Geert. 2001. *Culture's consequences*. Thousand Oaks, CA: Sage.
- Hogarth, Robin M. 1978. A note on aggregating opinions. *Organizational Behavior and Human Performance* 21:40–6.
- Hooijberg, Robert, and Nancy DiTomaso. 1996. Leadership in and of demographically diverse organizations. *Leadership Quarterly* 7:1–19.
- Howell, Jane M., and Christopher A. Higgins. 1990. Champions of technological innovation. *Administrative Science Quarterly* 35:317–41.
- Huber, George P., Kathleen M. Sutcliffe, C. Chet Miller, and William M. Glick. 1993. Understanding and predicting organizational change. In *Organizational change and redesign*, eds. G. P. Huber and W. H. Glick, 215–65. New York: Oxford Univ. Press.
- Jurkiewicz, Carole L., Tom K. Massey, Jr., and Roger G. Brown. 1998. Motivation in public and private organizations: A comparative study. *Public Productivity & Management Review* 21 (3): 230–50.
- Kaufman, Herbert. 1981. The administrative behavior of federal bureau chiefs. *Washington, D.C. Brookings*.
- Kearney, Richard C., Barry M. Feldman, and Carmine P. F. Scavo. 2000. Reinventing government: City manager attitudes and actions. *Public Administration Review* 60 (6): 535–47.
- Kelman, Steven. 2005. *Unleashing change: A study of organizational renewal in government*. Washington, D.C.: Brookings Institution Press.
- Kimberly, John R., and Michael J. Evanisko. 1981. Organizational innovation: The influence of individual, organizational, and contextual factors on hospital adoption of technological and administrative innovations. *Academy of Management Journal* 24:679–713.
- King, Nigel. 1990. Innovation at work: The research literature. In *Innovation and creativity at work*, eds. M. A. West and J. L. Farr, 15–59. New York: Wiley.
- Lee, Soo-Hoon, Poh-Kan Wong, and Chee-Leong Chong. 2005. Human and social capital explanations for R&D outcome. *IEEE Transactions on Engineering Management* 52:59–68.
- Levin, Jonathan, and Steven Tadelis. forthcoming. Contracting for government services: Theory and evidence from U.S. cities. *Journal of Industrial Economics*.
- Lonti, Zsuzsanna. 2005. How much decentralization? Managerial autonomy in the Canadian public service. *American Review of Public Administration* 35 (2): 122–6.
- Lonti, Zsuzsanna, and Anil Verma. 2003. The determinants of flexibility and innovation in the government workplace: Recent evidence from Canada. *Journal of Public Administration Research and Theory* 13 (3): 283–310.

- Lopez-de-Silanes, Florencio, Andrie Shleifer, and Robert W. Vishny. 1997. Privatization in the United States. *RAND Journal of Economics* 28 (3): 447–71.
- March, James G. 1991. Exploration and exploitation in organizational learning. *Organization Science* 2:71–87.
- Meeus, Maruis T. H., and Charles Edquist. 2006. Introduction to Part I: Product and process innovation. In *Innovation, science, and institutional change*, eds. J. Hage and M. Meeus, 23–37. Oxford: Oxford Univ. Press.
- Menzel, Herbert. 1960. Innovation, integration, and marginality: A survey of physicians. *American Sociological Review* 25 (5): 704–13.
- Meyer, Alan D., and James B. Goes. 1988. Organizational assimilation of innovation: A multilevel contextual analysis. *Academy of Management Journal* 31:897–923.
- Miles, Ian. 2005. Innovation in services. In *The Oxford handbook of innovations*, eds. J. Fagerberg, D. C. Mowery, and R. R. Nelson, 433–58. Oxford: Oxford Univ. Press.
- Moon, M. Jae. 2000. Organizational commitment revisited in new public management: Motivation, organizational culture, sector, and managerial level. *Public Performance & Management Review* 24 (2): 177–94.
- Moon, M. Jae, and Stuart Bretschneider. 2002. Does the perception of red tape constrain IT innovativeness in organizations? Unexpected results from a simultaneous equation model and implications. *Journal of Public Administration Research and Theory* 12 (2): 273–91.
- Moon, M. Jae, and Peter deLeon. 2001. Municipal reinvention: Managerial values and diffusion among municipalities. *Journal of Public Administration Research and Theory* 11:327–51.
- Moon, M. Jae, and Donald F. Norris. 2005. Does managerial orientation matter? The adoption of reinventing government an e-government at the municipal level. *Information Systems Journal* 15:43–60.
- Moore, Gary C., and Izak Benbasat. 1991. Developing an instrument to measure the perceptions of adopting an information technology management. *Information Systems Research* 2 (3): 192–222.
- Mumford, Michael D. 2000. Managing creative people: Strategies and tactics for innovation. *Human Resources Management Review* 10:313–55.
- Neter, John, William Wasserman, and Michael H. Kutner. 1985. *Applied linear statistical models*. Homewood, IL: Irwin.
- Noordegraaf, Mirko, and Rosemary Stewart. 2000. Managerial behaviour research in private and public sectors: Distinctiveness, disputes, and directions. *Journal of Management Studies* 37 (3): 427–43.
- Nord, Walter R., and Sharon Tucker. 1987. *Implementing routine and radical innovations*. Lexington, MA: Lexington Books.
- Nutt, Paul C. 2000. Decision-making success in public, private and third sector organizations: Finding sector dependent best practice. *Journal of Management Studies* 37 (1): 77–108.
- Nystrom, Paul C., K Ramamurthy, and Alla L. Wilson. 2002. Organizational context, climate and innovativeness: Adoption of imaging technology. *Journal of Engineering Technology Management* 19:221–47.
- Osborne, David, and Ted Gaebler. 1992. *Reinventing government: How the entrepreneurial spirit is transforming the public sector*. Reading, PA: Addison-Wesley.
- Ostlund, Lyman E. 1974. Perceived innovation attributes as predictors on innovativeness. *Journal of Consumer Research* 1 (2): 23–9.
- Page, Stephen. 2005. What's new about the new public management? Administrative change in the human services. *Public Administration Review* 65 (6): 713–27.
- Painter, Chris. 2005. Operating codes in the emerging system of local government: From 'top-down state' to 'disciplines pluralism'? *Public Money & Management* 25 (2): 89–98.
- Pelz, Donald C. 1985. Innovation complexity and the sequence of innovating stages. *Knowledge: Creation, Diffusion, Utilization* 6 (3): 261–91.
- Perry, James L. 1996. Measuring public service motivation: An assessment of construct reliability and validity. *Journal of Public Administration Research & Theory* 6 (1): 5–23.
- Perry, James L., and Hal G. Rainey. 1988. The public-private distinction in organization theory: A critique and research agenda. *Academy of Management Review* 13 (2): 182–201.

- Pollitt, Christopher, and Geert Bouckeaert. 2004. *Public management reform: A comparative analysis*. 2nd edition. Oxford: Oxford Univ. Press.
- Poole, Michael, Roger Mansfield, and Julian Gould-Williams. 2006. Public and private sector managers over 20 years: A test of the 'convergence thesis'. *Public Administration* 84 (4): 1051–76.
- Priem, Richard L., Douglas W. Lyon, and Gregory G. Dess. 1999. Inherent limitations of demographic proxies in top management team heterogeneity research. *Journal of Management* 25 (6): 935–53.
- Rivera, Mark D., George Streib, and Katherine G. Willoughby. 2000. Reinventing government in council-manager cities. *Public Performance & Management Review* 24 (2): 121–32.
- Roberts, Nancy C., and Paula J. King. 1989. The process of public policy innovation. In *Research on the management of innovation: The Minnesota studies*, eds. A. H. Van de Ven, H. L. Angle, and M. S. Poole, 303–35. New York: Oxford Press.
- Roberts, Peter W., and Raphael Amit. 2003. The dynamics of innovative activity and competitive advantage: The case of Australian retail banking, 1981 to 1995. *Organization Science* 14:107–22.
- Rogers, Everett M. 1995. *Diffusion of innovations*. NY: Free Press.
- Sabet, Mohamed G., and Donald Klingner. 1993. Exploring the impact of professionalism on administrative innovation. *Journal of Public Administration Research and Theory* 3 (2): 252–68.
- Sapat, Alka. 2004. Devolution and innovation: The adoption of state environmental policy innovations by administrative agencies. *Public Administration Review* 64 (2): 141–51.
- Schneider, Marguerite. 2007. Do attributes of innovative administrative practices influence their adoption? An exploratory study of US local government. *Public Performance & Management Review* 30 (4): 590–614.
- Schroeder, Roger G., Andrew H. Van de Ven, Gary D. Scudder, and Douglas Polley. 2000. The development of innovation ideas. In *Research on the management of innovation: The Minnesota studies*, eds. A. H. Van de Ven, H. L. Angle, and M. S. Poole, 107–34. New York: Oxford Press.
- Scott, Susanne G., and Reginald A. Bruce. 1994. Determinants of innovative behavior: A path model of individual innovation in the workplace. *Academy of Management Journal* 37:580–607.
- Sharma, Subhash, Richard M. Durand, and Oded Gur-Arie. 1981. Identification and analysis of moderator variables. *Journal of Marketing Research* 18 (3): 291–300.
- Sonfield, Matthew, Robert Lussier, Joel Corman, and Mary McKinney. 2001. Gender comparisons in strategic decision-making: An empirical analysis of the entrepreneurial strategy mix. *Journal of Small Business Management* 39 (2): 165–73.
- Stetler, Nichole Z. 2002. Gender differences in leadership: Current social issues and future organizational implications. *Journal of Leadership Studies* 8 (4): 88–99.
- Stone, Donald C. 1981. Innovative organizations require innovative managers. *Public Administration Review* 41 (5): 507–13.
- Streib, Gregory, Bert J. Slotkin, and Mark Rivera. 2001. Public administration from a practitioner perspective. *Public Administration Review* 61 (5): 515–25.
- Subramanian, Anand, and Sree Nilakanta. 1996. Organizational innovativeness: Exploring the relationship between organizational determinants of innovation, types of innovations, and measures of organizational performance. *Omega* 24:631–47.
- Sultan, Fareena, John U. Farley, and Donald R. Lehmann. 1990. A meta-analysis of applications of diffusion models. *Journal of Marketing Research* 27 (1): 70–7.
- Teske, Paul, and Mark Schneider. 1994. The bureaucratic entrepreneur: The case of city managers. *Public Administration Review* 54 (4): 331–40.
- Tidd, Joe, John Besant, and Keith Pavitt. 1997. *Managing innovation: Integrating technology, market, and organizational change*. New York: John Wiley.
- Thong, James Y L., and Chee-Sing Yap. 1995. CEO characteristics, organizational characteristics and information technology adoption in small businesses. *Omega* 23 (4): 429–42.
- Tornatzky, Louis G., and Katherine J. Klein. 1982. Innovation characteristics and innovation adoption-implementation: A meta-analysis of findings. *IEEE Transactions on Engineering Management* 29 (1): 28–45.
- Van de Ven, Andrew H., and Everett M. Rogers. 1988. Innovations and organizations. *Communication Research* 15:632–51.

- Walker, Richard M. 2008. An empirical evaluation of innovation types and organizational and environmental characteristics: Towards a configuration approach. *Journal of Public Administration Research and Theory* 18 (4): 591–615.
- Walker, Richard M. 2006. Innovation type and diffusion: An empirical analysis of local government. *Public Administration* 84 (2): 311–35.
- Walker, Richard M. 2004. *Innovation and organizational performance: Evidence and a research agenda* AIM (Advanced Institute of Management Research, Cardiff University) Working Paper ISSN: 1744–0069.
- Walker, Richard M., and George A. Boyne. 2006. Public management reform and organizational performance: An empirical assessment of the U.K. labor government public service improvement. *Journal of Policy Analysis Management* 25 (2): 371–93.
- Walker, Richard M., and Gareth Enticott. 2004. Using multiple informants in public administration: Revisiting the managerial values and actions debate. *Journal of Public Administration Research and Theory* 14:417–34.
- West, Michael A., and Neil R. Anderson. 1996. Innovation in top management teams. *Journal of Applied Psychology* 81:680–93.
- Wilson, Alla L., K. Ramamurthy, and Paul C. Nystrom. 1999. A multi-attribute measure for innovation adoption: The context of imaging technology. *IEEE Transactions on Engineering Management* 46 (3): 311–21.
- Wise, Lois Recascino. 1999. The use of innovative practices in the public and private sectors. *Public Performance & Management Review* 23 (2): 150–68.
- Wolfe, Richard A. 1994. Organizational innovation: Review, critique, and suggested research directions. *Journal of Management Studies* 31:405–31.
- Young, Gary J., Martin P. Charns, and Stephen M. Shortell. 2001. Top manager and network effects on the adoption of innovative management practices: A study of TQM in a public hospital system. *Strategic Management Journal* 22:935–51.
- Zaltman, Gary, Robert Duncan, and Jonny Holbek. 1973. *Innovations and organizations*. New York: Wiley.