

Using Employee Empowerment to  
Encourage Innovative Behavior in the Public Sector

Sergio Fernandez

&

Tima Moldogaziev

Indiana University  
School of Public and Environmental Affairs  
SPEA 449  
1315 E. Tenth Street  
Bloomington, Indiana 47405

Manuscript is currently under review. Please do not cite without permission of authors.

## **Abstract**

Employee empowerment programs have been widely adopted in the public sector as a way to improve organizational performance. Empowered employees improve performance largely by finding innovative ways of correcting errors in service delivery and redesigning work processes. Failure to encourage innovation can seriously undermine the effectiveness of empowerment programs. Based on Bowen and Lawler's conceptualization of employee empowerment as a multi-faceted management approach, this study explores how different empowerment practices can be used to encourage U.S. federal government employees to seek out new and better ways of doing things. The empirical results show that while employee empowerment as an overall approach can increase encouragement to innovate, empowerment practices have divergent effects, and some may even discourage innovation.

During the 1980s and 1990s, many American firms adopted employee empowerment programs to help maintain their competitive edge in the face of rising global competition (Bowen and Lawler, 1992; 1995; Lawler, Mohrman, and Ledford, 1995; Conger and Kanungo, 1988; Thomas and Velthouse, 1990; Spreitzer, 1995, 1996; Potterfield, 1999). In the private sector, empowerment has been linked to improved performance (Spreitzer, 1995; Lawler, Mohrman, and Ledford, 1992, 1995; Neilsen and Pedersen, 2003; Kirkman and Rosen, 1999) and increased employee job satisfaction (Lawler, Mohrman, and Ledford, 1995; Kirkman and Rosen, 1999) and organizational commitment (Lawler, Mohrman, and Ledford, 1995; Guthrie, 2001; Kirkman and Rosen, 1999). Empowerment also gained currency among government reformers, having figured prominently in the New Public Management (NPM) reforms undertaken in the United States, United Kingdom, Australia, Canada, France, Sweden and Norway (Kettl, 2005; Peters, 1996; Wise, 2002; Pollitt, 1990; Matheson, 2007). A growing number of public management studies indicate employee empowerment is positively related to job satisfaction (Wright and Kim, 2004; Kim, 2002; Lee, Cayer, and Lan, 2006; Park and Rainey, 2007), organizational commitment (Park and Rainey, 2007), and performance (Lee, Cayer and Lan, 2006; Fernandez and Moldogaziev, 2011) in the public sector.

An important causal pathway by which employee empowerment influences performance is through innovative behavior on the part of frontline employees (Bowen and Lawler, 1992, 1995; Thomas and Velthouse, 1990; Kanter, 1983; Gore, 1993). Empowered employees improve performance by recovering quickly from errors in service delivery, learning from those recoveries, and generating innovative proposals for redesigning processes and products. Failure to encourage such behavior can seriously undermine the effectiveness of empowerment programs. The link between empowerment and encouragement to innovate is of particular significance in the public

sector, where goal ambiguity, high levels of formalization, and restrictions on the ability to reward extrinsically (see Rainey, 2009) might dampen or even neutralize the effectiveness of empowerment programs. Based on Bowen and Lawler's (1992, 1995) conceptualization of employee empowerment, this study explores how different empowerment practices influence U.S. federal government employees' level of encouragement to innovate. In this study, encouragement to innovate is viewed as an affective state or experience of feeling felt by public employees (see Locke and Latham, 2004). The empirical results show that while employee empowerment as an overall approach can increase encouragement to innovate, empowerment practices have divergent effects, and some may even discourage innovation. Specifically, empowerment practices aimed at providing employees with access to job related knowledge and skills and granting them discretion to change work processes increase encouragement to innovate. Offering employees rewards based on performance, however, reduces such encouragement. The next section offers a review of the literature on employee empowerment. The discussion then turns to the data and methods used in the analysis. The results of the statistical analysis are then presented. The study concludes with a discussion of its limitations and implications for theory and future research.

### **Defining Employee Empowerment**

Scholars have made significant headway in developing the construct of employee empowerment. They have failed, however, to reach consensus on what employee empowerment actually means (Potterfield, 1999; Conger and Kanungo, 1988; Thomas and Velthouse, 1990). Two distinct theoretical perspectives have emerged in the literature, a managerial and a psychological one. From a managerial perspective, employee empowerment is a relational construct that describes how those with power in organizations (i.e., managers) share power and formal authority with those lacking it (i.e., employees) (Conger and Kanungo, 1988). The intellectual origins of this construct

date back to McGregor's (1960) Theory Y of leadership, Likert's (1967) classification of managerial styles, and other seminal contributions to the Human Relations movement in organization theory (Herrenkohl, Judson, and Heffner, 1999; Potterfield, 1999). Up until 1990, the tendency among scholars adopting the managerial perspective was to equate empowerment exclusively with delegating or sharing decision making authority with frontline employees through various participative management techniques such as management by objectives, quality circles, and employee involvement in goal setting and strategic decision making (see Kanter, 1983; Salancik and Pfeffer, 1974; Pettigrew, 1972). Dissatisfaction with this narrow characterization of employee empowerment led to two important developments: a refined view of empowerment as a multi-faceted approach to management involving more than simply sharing authority with subordinates, and the re-conceptualization of empowerment as a psychological construct.

Bowen and Lawler (1992, 1995), who analyzed the growing use of empowerment practices among service firms, observed that sharing authority with frontline employees is necessary but insufficient for realizing the benefits of empowerment. As they noted, "many empowerment programs fail when they focus on 'power' without also redistributing information, knowledge and rewards" (1992, p. 32). Bowen and Lawler defined empowerment as an "approach to service delivery" entailing various management practices aimed at sharing four organizational "ingredients" with frontline employees: "(1) information about the organization's performance, (2) rewards based on the organization's performance, (3) knowledge that enables employees to understand and contribute to organizational performance, and (4) power to make decisions that influence organizational direction and performance" (1992, p. 32). Importantly, they argued that these four elements interact with each other, having a multiplicative rather than additive effect on performance.

Dissatisfied with the treatment of employee empowerment as a relational construct, another group of scholars worked to develop the psychological construct of empowerment. From this new perspective, empowerment is an internal cognitive state characterized by enhanced feelings of self-efficacy (Conger and Kanungo, 1988) or increased intrinsic task motivation (Thomas and Velthouse, 1990). Based on Vroom (1964) and Lawler's (1973) work on expectancy theory of motivation, Conger and Kanungo (1988) argued that one's motivation to increase effort is in part a function of two expectancies: the expectancy that one's effort will result in the desired level of performance (Expectancy I, also called the self-efficacy expectation by Bandura, 1977, 1986) and the expectancy that performance will produce a desired outcome or reward (Expectancy II). For Conger and Kanungo (1988), as employees become more empowered, their self-efficacy expectations will be enhanced, thereby increasing the amount of effort and time they dedicate to performing a task (p. 476). Thomas and Velthouse (1990) expanded upon Conger and Kanungo's conceptualization by defining empowerment as increased intrinsic task motivation that comes from making a task meaningful, identifying with it, and finding expressive value in it. Four personal assessments of a task are argued to positively influence intrinsic task motivation: impact, competence, meaningfulness, and choice<sup>1</sup>. To the extent that an employee makes positive assessments of these four aspects of the task, he or she will feel a heightened level of intrinsic task motivation and, therefore, be empowered. Spreitzer's (1995, 1996) research showed that elements of psychological empowerment resembling Conger and Kanungo's four assessments of a task are positively associated with perceived effectiveness and innovativeness.

Scholars clearly have divergent notions of what constitutes employee empowerment. One way out of this morass is to resist the temptation of taking sides in the debate over whether empowerment is a relational or motivational construct and instead to treat both as complementary

pieces of the empowerment puzzle. These two constructs represent qualitatively different phenomena, the relational construct representing managerial behavior and the motivational one representing employee cognition. Empowerment might best be understood as a *process* involving a set of management practices (sharing authority, resources, information, and rewards) that affect employee cognitions (self-efficacy, motivation, job satisfaction), which in turn influence performance (effort, productivity) (see Thomas and Velthouse, 1990; Spreitzer, 1995, 1996; Bowen and Lawler, 1992, 1995). The management perspective on empowerment has a long history and offers a set of tangible practices or “levers” managers can pull to improve performance. The important contributions derived from the psychological perspective must also be acknowledged. Empowerment practices indeed might effect a change in motivation before performance improvements materialize. As empowered employees have a higher expectancy in their ability to perform a task successfully, they exert greater effort and persist in those efforts when faced with adversity. A sense of autonomy at work, along with the feeling of having control over the outcome, also increases effort.

In addition to exerting greater effort or “working harder,” empowered employees also seem to perform better by working “smarter”, that is, by seeking out new and better ways of doing things. Thomas and Velthouse (1990) alluded to this when they explained that intrinsically motivated individuals “may demonstrate flexibility in controlling their own task accomplishment, [and] initiation of new tasks as problems or opportunities arise” (p. 673; see also Kanter, 1983). Bowen and Lawler noticed two forms of innovative behavior resulting in performance gains: when frontline employees take rapid and spontaneous steps to “recover” from poor service delivery and adapt services to meet the idiosyncratic needs of customers, and when they move beyond reactive recovery to proactively redesigning processes and systems and creating new products and services.

A product of the Clinton Administration, the National Performance Review (NPR) identified employee empowerment as one of the keys to making government more efficient and effective. Frontline employees were argued to be the source of many innovative solutions to problems facing public organizations since they are closest to problems and more knowledgeable about how to solve them. Reformers expected improved performance to come from “turning the entire management system upside down” by empowering frontline employees to exercise their judgment, giving them training and resources needed to get the job done, and holding them accountable for results (Gore, 1993). Ironically, however, the NPR and other NPM reform initiatives involved adopting empowerment programs in concert with reforms such as downsizing and privatization that entailed greater managerial control and signaled dissatisfaction and mistrust of public employees (Barzelay, 2001; Peters and Pierre, 2000). One skeptical observer even concluded that the call to empower public employees is a blame-avoidance tool that allows politicians to deflect any blame for the failure of managerial reforms (Cohn, 1997). The extent to which these reforms have created an empowered state of mind among public employees thus remains an open question.

### **Empowerment Practices and Encouragement to Innovate**

Research on innovation in the public sector has shown that while elected officials and political appointees are the source of many innovations (Breaux, et al., 2002; Wallin, 1997; Chakerian and Mavima, 2000; Kellough and Nigro, 2002), so are frontline employees who generate novel ideas through experimentation, accidental occurrences, and other forms of experience (Kamensky, 1996; Altshuler and Zegans, 1997; Borins, 2000a, 2000b; Thompson and Sanders, 1997; Light, 1998). Many of the innovations arising out of the National Performance Review originated from the experiences of practitioners (Kemmensky, 1996). Reinvention labs were set up in many federal agencies to give employees dispensation to modify, streamline, and reinvent work

processes and organizational structures in their agencies. Altshuler and Zegans (1997), in their review of award-winning innovations in American government, found that public servants who initiated the innovation were more likely to be street-level bureaucrats in direct contact with clients than senior managers. Similarly, Borins (2000a, 2000b) found that in the U.S. and Canada, the most frequent initiators of innovations were career civil servants at the middle manager and frontline employee levels, not elected officials or agency heads.

If frontline employees are an important source of innovative ideas, how can empowerment be used to encourage them to innovate? It is important to keep in mind that, according to Bowen and Lawler, employee empowerment is a multifaceted approach involving a variety of management practices aimed at sharing power, information, resources, and rewards with employees. It is essential, therefore, to understand how each of these practices can influence feelings of encouragement to innovate. The relationship between practices aimed at sharing power with employees and innovation is one that is well-established in the innovation literature. There are various ways in which granting discretion to employees can cause them to feel more encouraged to innovate. By loosening controls, managers give entrepreneurial employees the autonomy or freedom to tinker with existing elements and practices and reconfigure them in new ways (Levin and Senger, 1994; Kanter, 1983). Pushing authority downward can also encourage employees to innovate by imparting a sense of control and responsibility for the quality of their work (Hackman and Oldham, 1976). Finally, being granted the authority to change work processes may increase encouragement to innovate by raising one's level of confidence that he or she will not be called out or punished for failed innovations (Edmonson, 1999; see also Light, 1998). Importantly, public agencies have been found to have higher levels of formalization than private firms (Rainey and Bozeman, 2000). The profusion of rules and regulations in government could prevent public

managers from granting sufficient discretion to achieve more than just trivial changes in the way work is organized and performed. A highly formalized work setting can also undermine psychological safety and diminish the extent to which employees feel encouraged to innovate. Notwithstanding these constraints more typical of the public sector, the first hypothesis is proposed:

*Hypothesis 1: The practice of granting employees discretion to change work processes will be positively correlated with encouragement to innovate.*

Efforts to enhance employees' access to job related knowledge and skills through training and job-embedded learning have been linked to receptivity to new ideas and creativity. Training and professional development activities help to diffuse innovations, as employees learn about and introduce ideas applied successfully in other organizations. They also expose employees to a broader palette of ideas that can be brought to bear on new problems (Damanpour, 1991; Thompson, 1965; Katz and Tushman, 1981). Because training and development improves an employee's ability to diagnose and solve technical problems, the odds are increased that innovative proposals will become effective practices (McGinnis and Ackelsberg, 1983; Dewar and Dutton, 1986). Enhanced knowledge of alternatives for improving performance and of confidence in the success of those alternatives should cause employees to feel more encouraged to innovate. Thus, the second hypothesis:

*Hypothesis 2: The practice of providing employees with access to job related knowledge and skills will be positively correlated with encouragement to innovate.*

Communicating goals and priorities to employees and offering feedback on performance are practices that have been found to encourage innovation. Specific and challenging goals in general serve to raise employee motivation and performance (Locke and Latham, 1990). Top-down communication that conveys the leadership's priorities and goals can, therefore, encourage

achievement-oriented employees to seek new strategies and tactics for attaining those goals.

Negative feedback indicative of failure also signals the need to search for new ways of narrowing the performance gap (Cyert and March, 1963; Manns and March, 1978; Fernandez and Wise, 2010), thereby encouraging employees to innovate. While goal ambiguity in the public sector can undercut the effectiveness of goal setting as a motivational approach (Rainey, 2009), at the level of the work team or the individual employee, goals could be sufficiently clear for this empowerment practice to have a positive impact on the extent to which an employee feels encouraged to innovate. This leads to the third hypothesis:

*Hypothesis 3: The practice of providing employees with information about goals and performance will be positively correlated with encouragement to innovate.*

Finally, intrinsic job characteristics have been found to have a stronger impact on employee attitudes than extrinsic ones (Deci, 1972; O'Reilly and Caldwell, 1980; Mottaz, 1985). However, a large body of research shows pay and other extrinsic rewards can still be used effectively to increase effort, performance and job satisfaction (Green and Haywood, 2008; O'Reilly and Caldwell, 1980; Mottaz, 1985; Lawler, Mohrman, and Ledford, 1992, 1995). Even among public employees with higher levels of public service motivation, monetary rewards appear to be significantly valued (Wittmer, 1991; Wright, 2007; Alonso and Lewis, 2001; Perry, Mesch, and Paarlberg, 2006). Evidence suggests pay-for-performance in the public sector is often only marginally effective when it comes to improving performance (Perry, Engbers, and Jun, 2009; Kellough and Lu, 1993). This is due at least in part, however, to flawed implementation<sup>2</sup>.

Based on the research cited above, it is reasonable to conclude that empowerment practices aimed at offering financial rewards based on performance will cause employees to feel more encouraged to innovate. There is also reason to believe, however, that tying pay to performance can

discourage innovativeness in government agencies. Change can cause significant turbulence that diminishes short term performance until new processes can be learned and institutionalized (Fernandez and Rainey, 2006; Amburgey, Kelly and Barnett, 1993). This could incentivize employees to stick with routine ways of doing things and avoid disruptive innovations that might pay off only in the long term. In addition, work on self-determination theory indicates introducing extrinsic rewards for work that was intrinsically motivating may actually reduce one's motivation and effort to complete a task (Deci, 1971; Ryan and Deci, 2000). In light of the divergent views expressed above, the fourth hypothesis is proposed:

*Hypothesis 4: The practice of offering employees rewards based on performance will be correlated with encouragement to innovate, but the direction of the correlation could be either positive or negative.*

### **Data and Methods**

This section provides a description of variables, statistical techniques, and data used in the empirical analysis. The following model was developed to estimate the relationship between empowerment practices and employee encouragement to innovate:

*encouragement to innovate = f(practice 1, practice 2, practice 3, practice 4, rewards for innovation, job satisfaction, perceived performance, resources, knowledge sharing, trust in leader, location, minority, age)*

where Bowen and Lawler's (1992, 1995) four empowerment practices are *practice 1*, providing information about goals and performance; *practice 2*, offering rewards based on performance; *practice 3*, providing access to job related knowledge and skills; and *practice 4*, granting discretion to change work processes.

## Dependent variable

The dependent variable, *encouragement to innovate*, is defined as an affective state or experience of feeling felt by public employees. It represents only one component—the *emotion* or affect component—of the complex motivational process involving needs, values, motives, emotional appraisals and behavioral responses to them, including effort (see Locke and Latham, 2004). As a result, it should not be confused with *motivation* to innovate or actual innovative behavior. The dependent variable is measured using responses to the following ordinal survey item: “I feel encouraged to come up with new and better ways of doing things.” The response categories ranged from 1 = “strongly disagree” to 5 = “strongly agree.” Approximately 5% of respondents answered “strongly disagree”; 13% answered “disagree”; 19% answered “neither agree nor disagree”; 40% answered “agree”; and 22% answered “strongly agree.” This distribution indicates sufficient variance and representation of each of the five response categories to allow reasonable estimations and tests of the hypotheses offered above. On the face of it, the dependent variable is an ordinal variable that one would estimate using Ordered Logit Model (OLM) or Ordered Probit Model (OPM) regression. However, as the discussion of model selection and fit statistics that follows reveals, fit statistics and violation of the parallel regression assumption justify estimation using Multinomial Logit Model (MNL) regression.

Measuring the dependent variable using a single survey item is one of this study’s limitations. Single item measures of a construct can be just as valid as multi-items ones, particularly in terms of predictive validity, when the construct consists of a concrete singular object and a concrete attribute of that object (e.g., consumer appeal of a brand or product) (Bergkvist and Rossiter, 2007). Encouragement to innovate appears to be a more complex psychological construct warranting the use of a multiple-item measure. Single-item measures of psychological constructs

like job satisfaction, however, have been found to correlate at about 0.70 with multi-item measures (Wanous, Reichers, and Hudy, 1997). Thus, although not preferable to a multi-item measure, the single-item measure of encouragement to innovate used here is at least adequate.

### **Independent variables**

Survey indicators were used to construct summated rating scales for *practice 1*, *practice 2*, *practice 3*, and *practice 4*. As can be seen in Appendix 1, the survey items selected for each of the scales exhibit face validity and appear to be measuring the type of management behavior described by Bowen and Lawler. Cronbach's alpha tests show moderate to high levels of internal consistency, with scale reliability statistics ranging from 0.74 for *practice 3* to 0.88 for *practice 2*. The descriptive statistics for these variables and the control variables are shown in Table 1.

--Insert Table 1 about here--

A major issue that comes forward is whether these measures of empowerment stand the test of discriminant and convergent validity. The four empowerment variables were subjected to a higher-order confirmatory factor analysis (CFA) that was performed using the *AMOS* software package to answer this question (see Appendix 3). A variety of goodness-of-fit indices from the CFA support a four-factor model of employee empowerment, while rejecting a single-factor model<sup>3</sup>. Tests using the average variance explained (AVE) statistic offer evidence of both convergent and discriminant validity<sup>4</sup>.

### **Control variables**

The model includes controls for factors that influence innovativeness. The perception that innovative behavior is rewarded should be a strong motivator of such behavior. The model thus includes the variable *rewards for innovation*, which is measured using an indicator of the extent to which the respondent feels creativity and innovation are rewarded. The actual survey items used to

measure this and other control variables are shown in Appendix 2. This control variable and the independent variable *practice 2* are correlated at about the  $r = 0.60$  level. Despite the relatively high correlation and overlap between the two variables (both represent efforts to reward employees), the variables measure distinct managerial practices. The variable *practice 2* represents the common practice of offering an employee rewards (e.g., pay, bonuses) based on his or her individual performance during the previous year, as determined by an annual performance appraisal. A review of programs designed to reward innovation in the federal government, however, indicate that these operate independently of the annual performance appraisal cycle; have a different time perspective, relying either on projections of impact or on historical data going back much further than the previous year; may reward either individuals or groups; and often provide only nonmonetary rewards or recognition (see Borins, 2001)<sup>5</sup>.

More satisfied employees are generally more committed to the organization and thus more likely to look for ways to improve performance (Hage and Aiken, 1967; Thompson, 1965). As a result, the variable *job satisfaction*, a global measure of employee job satisfaction, is included in the model. Poor or substandard performance has been found to induce search behavior among organizational members (Cyert and March, 1963; March and Simon, 1993). The effect of perceptions of performance on innovativeness is controlled for by including the variable *perceived performance* in the model. Successfully cultivating innovative ideas often requires a commitment of financial and material resources to launch and sustain an innovation (Cyert and March, 1963; Berry, 1994; Fernandez and Wise, 2010). When resources are scarce, managers are less likely to commit them toward anything other than ongoing operations, thereby discouraging frontline employees from innovating. The variable *sufficient resources* is included in the model, therefore, to control for the effects of perceived adequacy of resources on encouragement to innovate.

In addition to vertical or downward communication captured in part by *practice 1*, horizontal communication and exchange of information among employees has been found to be a predictor of innovativeness (Monge, Cozzens, and Contractor, 1992; Kanter, 1982; Tjosvold and McNeely, 1988). To control for this effect, the variable *information sharing* is included in the model. High exchange relationships between superiors and subordinates that are characterized by high levels of trust have been linked to higher subordinate satisfaction, stronger organizational commitment by the subordinate, and higher subordinate performance (see Bass, 1990). The extent to which the respondent has trust and confidence in his/her supervisor could encourage innovative behavior. The variable *trust in leader* is thus included in the model. Finally, the model includes a set of controls for demographic characteristics of the survey respondent, including a dummy variable for whether or not the respondent works in a field office (*location*), a dummy variable for whether or not the respondent is nonwhite (*minority*), and an ordinal variable for the respondent's age (*age*).

## **Data**

The data for the analysis are derived from the 2006 Federal Human Capital Survey (FHCS) conducted by the U.S. Office of Personnel Management (OPM). The 2006 FHCS was administered electronically via the Internet (with limited distribution of paper surveys to those without Internet access) to 390,657 federal government employees at five levels ranging from non-supervisory to Senior Executive Service employees. The government-wide response rate was fifty-seven percent ( $N = 221,479$ ). OPM appears not to have performed an analysis of nonresponse bias. Respondents worked for eighty-two cabinet-level and smaller independent agencies representing ninety-seven percent of the executive branch workforce. OPM used a stratified sampling technique to produce generalizable results for each individual agency as well as the entire federal government; in some of

the smaller agencies, all employees were surveyed. Out of the 221,479 respondents to the survey, 154,793 are included in the final analysis, with the remaining observations dropped due to missing data on the outcome, explanatory and/or control variables. No meaningful differences between observations dropped from the analysis and those included were found.

The concept of employee empowerment applies particularly to frontline and lower-level employees. The focus of the analysis, therefore, is on those employees at the three lowest levels of the federal bureaucracy: non-supervisory employees, team leaders, and supervisors; managers and senior executives are excluded from this analysis<sup>6</sup>. The 2006 FHCS contains 189,856 observations for non-supervisory employees, team leaders, and supervisors. Importantly, supervisors, managers, and executives are somewhat over-represented due to the stratified sampling technique used by OPM. This should help, however, to correct for the bias that often occurs from having a disproportionate share of lower level respondents to such surveys (see Enticott, Boyne, and Walker, 2009, p. 233).

### **Model selection and fit tests**

The variable *encouragement to innovate* is a limited dependent variable measured using an ordinal survey indicator. Using ordinary least squares (OLS) regression to estimate this type of dependent variable can result in biased coefficients and misleading results (McKelvey and Zavoina, 1975; Winship and Mare, 1984; Long, 1997; Long and Freese, 2005). Thus, three sets of competing equations using Ordered Logit Model (OLM), Ordered Probit Model (OPM), and Multinomial Logit Model (MNL) regression were estimated. The results of these three competing functional forms of *encouragement to innovate* are provided in Table 2. The conventional fit statistics such as the Aikake's Information Criterion (AIC) and the Bayesian Information Criterion (BIC) scalars suggest that MNL provides a better fit for the data. The absolute value of the difference between

these statistics for MNLM in contrast to both ordered probit and logit specification is large; the MNLM estimates are significantly and sufficiently smaller (see Long, 1997). Similarly, the likelihood ratio  $\chi^2$  coefficient for the MNLM suggests a better fit than the ordered probit and ordered logit specifications of the dependent variable. Finally, the  $R^2$  coefficients reported (McFadden's, Cox-Snell's, and Cragg-Uhler's) indicate that the multinomial logit and ordered logit functional forms of the dependent variable produce just slightly more precise results than the OPM model. In short, the evidence at hand from global tests of fit appears to point to the MNLM as the preferred specification of *encouragement to innovate*.

--Insert Table 2 about here--

The OLM and OPM model estimations are based on the rationale of proportional odds or parallel regression equations. If the ordered models violate this assumption, then a higher-order specification is favored. Consequently, the next step in identifying the proper model for the data is determining whether the OLM estimates (the better of the two ordered models) violate the fundamental assumption of parallel regression. The *Brant*-test of parallel regression assumption was run to obtain such evidence. The results suggest that the four empowerment practices taken together violate the assumption of parallel regression. When taken individually, none of the empowerment practices passes the test, failing the *Brant*-test quite significantly ( $p < 0.001$ ). None of the control variables in the model pass the parallel regression test either; in each case a significant test statistic provides evidence that the parallel regression assumption has been violated. The overall model fails the test as well, indicating a multinomial specification should be used. Further, in order to relax the parallel regression assumption employed by a traditional ordered logit model, an omnibus likelihood ratio test for the generalized ordered logit (GOLM) constrained and unconstrained models is run. The likelihood ratio test for proportional odds shows that the model

fails the omnibus test, too ( $\chi_{LR, df=392}=3,637.83; p < 0.001$ ). These results point to the multinomial model of *encouragement to innovate* as the preferred model specification.

## Results

The results of the empirical analysis are presented in this section. In the MNLM, the nonlinear probability of an outcome to occur, i.e.,  $y = m$  given  $\mathbf{x}$  is:

$$\Pr(y = m|\mathbf{x}_i) = \frac{\exp(\mathbf{x}_i\boldsymbol{\beta}_m)}{\sum_{j=1}^J \exp(\mathbf{x}_i\boldsymbol{\beta}_j)}; \text{ where } \boldsymbol{\beta}_A = 0$$

and where,  $\mathbf{x}\boldsymbol{\beta}$  represents the model equation; in this case the dependent variable is *encouragement to innovate*.

The MNLM results presented in Table 2 show that three of the four empowerment practices—*practice 2*, *practice 3* and *practice 4*—are statistically correlated with *encouragement to innovate* ( $p < 0.001$ ), while *practice 1* fails to achieve statistical significance ( $p = 0.478$ )<sup>7</sup>. The comparison response category is “agree”<sup>8</sup>. Importantly, the substantive effects of *practice 2*, *practice 3* and *practice 4* appear to be sizeable. This is illustrated graphically in Figures 1 through 4, which plot the predicted levels of the dependent variable across the range of the empowerment practices, with all other variables held constant at their mean values (also see Table 3).

--Insert Table 3 about here--

Figure 1 plots the levels of *encouragement to innovate* across *practice 1*, providing information about goals and performance. There is no apparent relationship between this empowerment practice and the dependent variable. All the lines representing the predicted probabilities for the five response categories of the dependent variable are generally flat across the range of *practice 1*. Even when a slight slope is observed (e.g., for the outcome category “strongly agree”), the magnitude of the effect is close to nil.

--Insert Figures 1 and 2 about here--

The variable *practice 2*, offering rewards based on performance, is negatively correlated with *encouragement to innovate*. Figure 2 plots the predicted probabilities of the responses categories for the dependent variable across this empowerment practice. The predicted probabilities of categories “disagree” and “neither agree nor disagree” increase significantly by about 10% (from 3% to 13%) and 15% (from 19% to 34%), respectively, when moving across the range of *practice 2*. Conversely, the predicted probabilities of categories “agree” and “strongly agree” both decrease by about 13% across the range of *practice 2*. The predicted probabilities of category “strongly disagree” remain fairly steady.

The results support the hypothesis that *practice 3*, providing access to job related knowledge and skills, is positively correlated with *encouragement to innovate*. Among the four empowerment practices, *practice 3* has the largest substantive effect on the dependent variable. Figure 3 plots the predicted probabilities of the response categories for the dependent variable across *practice 3*. The predicted probabilities of categories “strongly agree” and “agree” increase sharply, but not linearly, by 0.44 and 0.25, respectively, when moving across the range of this empowerment practice. On the other hand, the predicted probabilities of categories “neither agree nor disagree” and “disagree” decrease sharply by more than 0.30 when moving across the range of *practice 3*. The line representing the predicted probabilities of response category “strongly disagree” shows only a slight negative slope.

--Insert Figures 3 and 4 about here--

As hypothesized, *practice 4*, granting discretion to change work processes, is positively correlated with *encouragement to innovate*. The predicted probabilities of the dependent variable across this empowerment practice are depicted in Figure 4, with the results resembling those for *practice 3*. The predicted probabilities of categories “strongly agree” and “agree” increase sharply

by 0.20 and 0.35, respectively, when moving across the range of this empowerment practice. Conversely, the figure shows the predicted probabilities of categories “neither agree nor disagree” and “disagree” decline by about 0.25 across the range of *practice 4*. Predicted probabilities for category “strongly disagree” remain largely unchanged.

The magnitude of the effects of the four empowerment variables have so far been interpreted in terms of changes in the predicted probabilities of the response categories. Another useful approach involves interpreting the odds ratio coefficients of the empowerment variables. This odds-ratios method gives a better sense of the magnitude of the effects regardless of the location on a scale across the range of an independent variable. It was reported above that *practice 1* has no apparent effect on the dependent variable. *Practice 2* has a negative and substantively significant effect on *encouragement to innovate*. A unit increase in this empowerment practice increases the odds of response category “disagree” vs. category “agree” occurring by a factor of 1.53, with all other variables held constant ( $p < 0.001$ ). In a similar manner, a one unit increase in *practice 2* increases the odds of category “neither agree nor disagree” vs. “agree” occurring by a factor of 1.26, all else held equal ( $p < 0.001$ ). Conversely, for every one unit increase in this empowerment practice, the odds of category “strongly agree” vs. category “agree” occurring decrease by a factor of 0.70 (a difference of roughly 43%), all else equal ( $p < 0.001$ ).

Both *practice 3* and *practice 4* have positive and substantively large effects on *encouragement to innovate*. A one unit increase in *practice 3* increases the odds of category “strongly agree” vs. “agree” occurring by a factor of 4.52, all else equal ( $p < 0.001$ ). Conversely, a unit increase in this empowerment practice decreases the odds of categories “neither agree nor disagree”, “disagree” and “strongly disagree” vs. category “agree” occurring by factors of 0.55, 0.36, and 0.19 (decreases of about 82%, 178%, and 438%), respectively, all other variables held

constant ( $p < 0.001$ ). A similar pattern is found with *practice 4*. A one unit increase in this last empowerment practice increases the odds of category “strongly agree” vs. category “agree” occurring by a factor of 1.78, all else equal ( $p < 0.001$ ). Conversely, for every unit increase in *practice 4*, the odds of categories “neither agree nor disagree” and “disagree” vs. category “agree” occurring decrease by factors of 0.57 and 0.32 (decreases of 75% and 213%), respectively, all else held constant ( $p < 0.001$ ).

Shifting the focus now to the control variables, Table 2 indicates that all but one control variable, *sufficient resources*, is statistically correlated with *encouragement to innovate*. However, only three of those variables—*rewards for innovation*, *trust in leader*, and *job satisfaction*—appear to have substantively significant effects (see also Tables 3 and 4). The variable *rewards for innovation* is positively correlated with the dependent variable and has one of the largest substantive effects, rivaling those of *practice 3* and *practice 4*. For every unit increase in this variable, the odds of “strongly disagree”, “disagree” and “neither agree nor disagree” occurring compared to “agree” decrease by factors of 0.19, 0.40 and 0.66 (differences of 438%, 150% and 52%), respectively, all else equal ( $p < 0.001$ ). Conversely, for every one unit increase in *rewards for innovation*, the odds of category “strongly agree” vs. “agree” occurring increase by a factor of 1.49, all else equal ( $p < 0.001$ ).

The variable *trust in leader* is also positively correlated with the dependent variable. A unit increase in this control variable decreases the odds of “disagree” and “neither agree nor disagree” occurring compared to “agree” by factors of 0.70 and 0.84 (differences of 43% and 19%), respectively, all else constant ( $p < 0.001$ ). Conversely, a unit increase in *trust in leader* increases the odds of “strongly agree” vs. “agree” occurring by a factor of 1.49, all else equal ( $p < 0.001$ ). The control variable *job satisfaction* is found to be positively correlated with *motivation to innovate*.

For every one unit increase in this control variable, the odds of “disagree” and “neither agree nor disagree” occurring compared to “agree” decrease by 0.87 and 0.90 (differences of roughly 15% and 11%), respectively, all else constant ( $p < 0.001$ ). Alternatively, for every one unit increase in *job satisfaction*, the odds of “strongly agree” vs. “agree” occurring increase by a factor of 1.29, all else constant ( $p < 0.001$ ).

The analysis above is based on a sample of federal employees at three levels: non-supervisory employees, team leaders, and supervisors. Separate multinomial regressions for each of these groups of employees were run to determine if the results varied by level. The results of these additional multinomial regressions were remarkably similar to those reported above, with one minor exception. The variable *practice 1*, which fails to achieve statistical significance in the multinomial regression using the larger sample, achieves statistical significance in the sample of just those employees with supervisory positions. In terms of substantive significance, however, this practice’s effect on the dependent variable is close to zero.

While the focus of the analysis has been on the effects of individual empowerment practices on *encouragement to innovate*, the relationship between empowerment as an overall approach and the dependent variable was also explored. The last model in Table 2 shows the results of a MNLM regression in which the primary independent variable is the overall factor score developed from all the indicators used to measure the four empowerment practices. The results show that this new overall empowerment measure has a strong, positive effect on the dependent variable ( $-2.24, p < 0.001$ ). This new model and the one with variables for the four empowerment practices are nearly identical in terms of model fit statistics, coefficients, and levels of statistical significance.

---Insert Table 4 about here---

Finally, we also test for interaction effects among the four empowerment practices. In a full-order interaction MNLM regression, the coefficients for the four-way interaction involving all four empowerment practices and for all possible three-way interaction combinations failed to achieve statistical significance at the  $p < 0.05$  level (results not shown). A MNLM regression was also tested that included all possible two-way interaction combinations. Adding those interaction terms had only a marginal effect on the fit statistics (the various  $R^2$  statistics increased by about 0.02), but the model's coefficients reveal some interesting results (see Table 5). The interactions between *practice 1* and *practice 2* and between *practice 2* and *practice 4* produce very small changes in the response categories of the dependent variable and appear to be trivial in their substantive significance. For the three two-way interactions involving *practice 3*, increasing the value of *practice 3* increases the probability of response category “strongly agree” occurring compared to most other response categories as the values of *practice 1*, *practice 2* and *practice 4* increase. Thus, providing employees with greater opportunities to learn and develop appears to enhance the effectiveness of all the other empowerment practices when it comes to encouraging innovation. For example, employees appear more encouraged to innovate when they have considerable knowledge and skills *and* ample discretion compared to when they have just one or the other. Similarly, setting goals and providing performance feedback seem to encourage innovation only when employees enjoy significant opportunities to learn and develop, perhaps because they are better equipped to achieve those goals and respond to feedback. Evidence is also found of a two-way interaction between *practice 1* and *practice 4*. Increasing the value of *practice 1* increases the probability of response categories “strongly agree” and “agree” occurring compared to “neither” as the value of *practice 4* increases. This suggests that setting goals and providing feedback may be

used to encourage innovative behavior when employees feel they are involved in decisions affecting how they structure and perform their work.

--Insert Table 5 about here--

### **Discussion and Conclusion**

Employee empowerment has gained widespread popularity as a high performance management approach that enables organizations to remain competitive and innovative. Although it was first widely adopted in the private sector, empowerment has become part and parcel of major government reforms around the world. This study explored the effectiveness of various empowerment practices at encouraging innovative behavior among frontline employees in the U.S. federal government. The empirical results show that not all empowerment practices encourage innovative behavior and that some even appear to discourage innovation.

Empowerment practices aimed at granting employees discretion to change work processes and at providing them with opportunities to acquire job related knowledge and skills have strong positive effects on employee encouragement to innovate. These results confirm a consistent pattern reported in the innovation literature: organizations that grant employees ample opportunities to exercise discretion and to learn and grow tend to be more innovative than others. They also indicate that attempting to empower employees by offering rewards based on performance inhibits innovativeness. Rewarding short term performance, as pay-for-performance schemes often do, seems to foster a myopic mindset among employees, causing them to settle for proven ways of doing things while eschewing disruptive changes that might produce only long term gains in performance. Interestingly, it is found that the expectancy that innovation itself is rewarded—rather than performance—encourages innovative behavior. The data used in the analysis prevent one from identifying the different intrinsic and extrinsic rewards conferred on innovative employees.

Additional research is needed to identify specific rewards that are most effective at promoting bottom up innovation in public organizations.

The practice of empowering frontline employees by providing information about goals and performance has no apparent independent effect on encouragement to innovate. Goals and performance feedback are often used in place of rules to coordinate and control behavior in organizations (Mintzberg, 1979). Efforts to control employees this way may constrain behavior and prevent employees from trying innovative solutions to problems, and may even cause resentment among employees who feel overburdened by reporting requirements and doubt the quality and usefulness of feedback (Tosi and Carroll, 1968). In addition, the effect of goal setting on learning appears to vary according to one's level of cognitive ability, with those with low ability benefiting more from goals than others with higher levels of cognitive ability (Kanfer and Ackerman, 1989). Research also suggests that setting clear and challenging goals is more effective at motivating employees facing simple, programmable tasks than those performing more complex tasks where learning and trial and error are at a premium (Winters and Latham, 1996). In short, when it comes to encouraging innovative behavior, the beneficial effects of providing information about goals and performance are contingent on the situation and may be offset by the detrimental ones.

The effects of different empowerment practices on encouragement to innovate appear to be largely independent of each other. Some evidence was found of interaction effects between two-way combinations of empowerment practices. For example, empowering employees by providing them with greater opportunities to learn and develop appears to slightly enhance the effectiveness of each of the other empowerment practices. The magnitude of these interaction effects, however, is generally quite small.

One limitation of the study is that the dependent variable only captures inclination to innovate. It is not possible to discern with any degree of certainty whether or not such inclination will translate into actual innovative proposals, whether or not those proposals are accepted, or the possible impact of those innovations on performance. Additional longitudinal research is needed to analyze the effects of encouragement to innovate on the frequency of innovations and on the consequences of those innovations.

The use of self-reported data from a single survey raises the specter of common method bias. Common method bias is generally believed to produce artificially inflated correlations (Crampton and Wagner, 1994), although in some cases the bias can also deflate correlations (Cote and Buckley, 1988; Podsakoff, et al., 2003). Two approaches were taken to detecting common method bias. First, a Harman single factor test of all the survey items in the 2006 FHCS produced a multiple factor solution. Second, it should be recalled that the confirmatory factor analysis supported a four factor model, and importantly, that a single factor model failed every single test for goodness-of-fit. These results, while not refuting the presence of common method bias, fail to produce convincing evidence of its presence. If indeed present, common method bias could conceivably have inflated the fairly strong correlations between the empowerment practices and the dependent variable. Some care should be taken, therefore, in interpreting the results of this analysis.

The confirmatory factor analysis results, while providing evidence of discriminant and convergent validity, suggest the need for further refinement of the measurement of employee empowerment used in this study. Nearly all of the fit statistics for the four-dimensional model of empowerment were found to be at acceptable levels, but many hovered around conventional cutoff points. In particular, the measurement of *practice 4*, granting discretion to change work processes, could be improved with additional indicators focusing on more specific ways in which discretion is

used to modify work processes. The four-dimensional definition of empowerment used in this study needs further validation across other large samples of public sector employees. Moreover, our understanding of these empowerment practices and how they encourage innovation could be explored further using in-depth case studies that rely on multiple data sources and methods of data collection, including direct observation.

As previously explained, the link between empowerment practices and encouragement to innovate is an important causal path by which empowerment can improve performance but it certainly is not the only possible one. Bowen and Lawler's empowerment practices could very well influence performance through increased job satisfaction, another employee attitude or cognition found to be associated with increased effort and productivity (Judge and Church, 2000). While previous studies have shown empowerment can increase job satisfaction in the public sector, they have not ventured beyond to explore the causal relationship between job satisfaction and performance. The use of path analysis or other structural equation modeling techniques could prove fruitful in describing the complex pattern of causal relationships among the various managerial practices, cognitions, and behavioral outcomes involved in the empowerment process. Additional research using structural equation modeling is also needed to begin to understand the institutional, organizational, and individual antecedents of empowerment, a topic almost completely neglected in the literature.

The large sample size used in the analysis and its widespread coverage of federal agencies suggest the results of this study are generalizable across large portions of the federal bureaucracy, particularly at the frontline and non-supervisory echelons. There is reason to believe, however, that a different pattern of results might emerge from analyses conducted at the state or local level of government. Previous research on empowerment suggests empowerment practices work best in

service delivery organizations where frontline employees are in direct contact with clients (Bowen and Lawler, 1992, 1995; Pottersfield, 1999). The fact that much larger proportions of state and local government employees are involved in direct service delivery compared to federal government employees could mean that empowerment practices are even more effective at encouraging innovative behavior at those lower levels of government.

Finally, normative and empirical questions about the consequences of granting significant discretion to frontline public employees remain. How will that discretion be used? One possibility is that extensive use of empowerment breeds reckless rule breaking among public employees. Although previous studies have shown that public managers behave responsibly when engaging in innovative behavior (Borins, 2000a; Berman and West, 1998) and seek political approval from elected officials when launching new initiatives (Golden, 1990), this issue is worthy of further investigation. Another possibility that should not be ruled out is that empowered public employees exercise discretion in ways that promote democratic responsiveness, such as through active representation in public programs like small- and women-owned business programs that are designed to promote racial and gender equity in the federal procurement arena.

## References

- Alonso, P. and Lewis, G. B. 2001. "Public Service Motivation and Job Performance: Evidence from the Federal Sector." *American Review of Public Administration*, 31: 363-380.
- Altshuler, A.A. and Zegans, M.D. 1997. "Innovation and Public Management: Notes from the State House and City Hall." In Altshuler, A. A. and Behn, R. D. *Innovation in American Government: Challenges, Opportunities, and Dilemmas*. Washington, D.C.: Brookings Institution Press.
- Amburgey, T. L., Kelly, D. and Barnett, W. P. 1993 "Resetting the Clock: The Dynamics of Organizational Change and Failure." *Administrative Science Quarterly*, 38: 51-73.
- Bandura, A. 1986. *Social Foundations of Thought and Action: A Social Cognitive Theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. 1977. *Social Learning Theory*. Englewood Cliffs, NJ: Prentice Hall.
- Barzelay, M. 2001. *The New Public Management: Improving Research and Policy Dialogue*. Berkeley, California: University of California Press, 2001.
- Bass, B.M. 1990. *Bass and Stogdill's Handbook of Leadership: Theory, Research, and Managerial Applications*. Third Edition. New York: Free Press.
- Bergkvist, L. and Rossiter, J. R. 2007. "The Predictive Validity of Multiple-Item versus Single-Item Measures of the Same Constructs." *Journal of Marketing*, 44: 175-184.
- Berman, E. K. and West, J. P. 1998 "Responsible Risk-Taking." *Public Administration Review*, 58: 346-352.
- Berry, F.S. 1994. "Innovation in Public Management: The Adoption of Strategic Planning." *Public Administration Review*, 54: 322-330.
- Borins, S. 2001. "Encouraging Innovation in the Public Sector." *Journal of Intellectual Capital*, 2: 310-319.
- Borins, S. 2000a. "Loose Cannons and Rule Breakers, or Enterprising Leaders? Some Evidence About Innovative Public Managers." *Public Administration Review*, 60: 498-507.
- Borins, S. 2000b. "What border? Public management innovation in the United States and Canada." *Journal of Policy Analysis and Management*, 19: 46-74.
- Bowen, D.E. and Lawler, E.E. 1992. "The Empowerment of Service Workers: What, Why, How, and When." *Sloan Management Review*, 33: 31-39.

- Bowen, D.E. and Lawler, E.E. 1995. "Empowering Service Employees." *Sloan Management Review*, 36:73-84.
- Breaux, D.A., Duncan, C.M., Keller, C.D. and Morris, J.C. 2002. "Welfare Reform, Mississippi Style: Temporary Assistance for Needy Families and the Search for Accountability." *Public Administration Review*, 62: 92-103.
- Chakerian, R. and Mavima, P. 2000. "Comprehensive Administrative Reform Implementation: Moving Beyond Single Issue Implementation Research." *Journal of Public Administration Research and Theory*, 11: 353-77.
- Cohn, D. 1997. "Creating Crises and Avoiding Blame: The Politics of Public Service Reform and the New Public Management in Great Britain and the United States." *Administration and Society*, 29: 584-616.
- Conger, J.A. and Kanungo, R.N. 1988. "The Empowerment Process: Integrating Theory and Practice." *Academy of Management Review*, 13: 471-482.
- Cote, J.A. and Buckley, R. 1988. "Measurement Error and Theory Testing in Consumer Research: An Illustration of the Importance of Construct Validation." *Journal of Consumer Research*, 14: 579-582.
- Crampton, S. and Wagner, J. 1994. "Percept-Percept Inflation in Micro-organizational Research: An Investigation of Prevalence and Effect." *Journal of Applied Psychology*, 79: 67-76.
- Cyert, R.M. and March, J.G. 1963. *A Behavioral Theory of the Firm*. Upper Saddle River, New Jersey: Prentice Hall.
- Damanpour, F. 1991. "Organizational Innovation: A Meta-analysis of Effects of Determinants and Moderators." *Academy of Management Journal*, 34: 555-590.
- Deci, E. 1971. "Effects of Externally Mediated Rewards on Intrinsic Motivation." *Journal of Personality and Social Psychology*, 18: 105-115.
- Dewar, R. and Dutton, J. 1986. "The Adoption of Radical and Incremental Innovation: An Empirical Analysis." *Management Science*, 32: 14-31.
- Edmonson, A. 1999. "Psychological Safety and Learning Behavior in Work Teams." *Administrative Science Quarterly*, 44: 350-383.
- Enticott, G., Boyne, G. A., and Walker, R. M. 2009. "The Use of Multiple Informants in Public Administration Research: Data Aggregation Using Organizational Echelons." *Journal of Public Administration Research and Theory*, 19: 229-253.

- Fan, X., Thompson, B. and Wang, L. 1999. "Effects of Sample Size, Estimation Method, and Model Specification on Structural Equation Modeling Fit Indexes." *Structural Equation Modeling*, 6: 56-83.
- Fernandez, S. and Moldogaziev, T. 2011. "Empowering Public Sector Employees to Improve Performance: Does it Work?" *American Review of Public Administration*, 41: 23-47.
- Fernandez, S. and Rainey, H.G. 2006. "Managing Successful Organizational Change in the Public Sector: An Agenda for Research and Practice." *Public Administration Review*, 66: 168-176.
- Golden, O. 1990. "Innovation in Public Sector Human Services Programs: The Implications of Innovation by "Groping Along." *Journal of Policy Analysis and Management*, 9: 219-248.
- Gore, A. 1993. *From Red Tape to Results: Creating a Government That Works Better and Costs Less*. Report of the National Performance Review. Washington, D.C.
- Greene, C. and Haywood, J. S. 2008. "Does Performance Pay Increase Job Satisfaction?" *Economica*, 75: 710-728.
- Guthrie, J. 2001. "High-Involvement Work Practices, Turnover, and Productivity: Evidence from New Zealand." *Academy of Management Journal*, 44: 180-192.
- Hackman, J.R. and Oldham, G.R. 1976. "Motivation Through the Design of Work: Test of A Theory." *Organizational Behavior and Human Performance*, 16: 250-279.
- Hage, J.T. and Aiken, M. 1967. "Program Change and Organizational Properties: A Comparative Analysis." *American Journal of Sociology*, 72: 503-519.
- Heinrich, C. J. 2007. "False or Fitting Recognition? The Use of High Performance Bonuses in Motivating Organizational Achievements." *Journal of Policy Analysis and Management*, 26: 281-304.
- Herrenkohl, R.C., Judson, G.T. and Heffner, J.A. 1999. "Defining and Measuring Employee Empowerment." *Journal of Applied Behavioral Science*, 35: 373-389.
- Judge, T. A. and Church, A. H. 2000. "Job Satisfaction: Research and Practice." In Cooper, C. L. and Locke, E. A. (Eds.) *Industrial and Organizational Psychology*. Oxford: Blackwell.
- Kamensky, J. 1996. "Role of 'Reinventing Government Movement' in Federal Management Reform." *Public Administration Review*, 56: 247-255.
- Kanfer, R. and Ackerman, P. L. 1989. "Motivation and Cognitive Abilities: An Integrative/Aptitude-Treatment Interaction Approach to Skill Acquisition." *Journal of Applied Psychology*, 74: 657-690.
- Kanter, R.M. 1982. "The Middle Manager as Innovator." *Harvard Business Review*, 95-105.

- Kanter, R.M. 1983. *The Change Masters: Innovations for Productivity in the American Corporation*. New York: Simon and Schuster.
- Katz, R. and Tushman, M. 1981. "An Investigation into the Managerial Roles and Career Paths of Gate Keepers and Project Supervisors in a Major R&D Facility." *R&D Management*, 11: 103-110.
- Kellough, J.E. and Lu, H. 1993. "The Paradox of Merit Pay in the Public Sector." *Review of Public Personnel Administration*, 13: 45-64.
- Kellough, J.E. and Nigro, L.C. 2002. "Pay for Performance in Georgia State Government: Employee Perspectives on Georgia Gain After 5 years." *Review of Public Personnel Administration*, 22: 146-166.
- Kettl, D.F. 2005. *The Global Public Management Revolution: A Report on the Transformation of Governance*. Second Edition. Washington, DC: Brookings Institution Press.
- Kim, S. 2002. "Participative Management and Job Satisfaction: Lessons for Management Leadership." *Public Administration Review*, 62: 231-241.
- Kirkman, B.L. and Rosen, B. 1999. "Beyond Self-Management: Antecedents and Consequences of Team Empowerment." *Academy of Management Journal*. 42: 58-74.
- Lawler, E.E. III. 1973. *Motivation in Work Organizations*. Monterey: Goodyear.
- Lawler, E.E. III., Mohrman, S.A. and Ledford, G.E. 1995. *Creating High Performance Organizations: Impact of Employee Involvement and Total Quality Management*. San Francisco: Jossey-Bass Publishers.
- Lee, H., Cayer, N.J. and Lan, G.Z. 2006. "Changing Federal Government Employee Attitudes Since the Civil Service Reform Act of 1978." *Review of Public Personnel Administration*, 26: 21-51.
- Levin, M. A. and Sanger, M. B. 1994. *Making Government Work: How Entrepreneurial Executives Turn Bright Ideas into Real Results*. San Francisco: Jossey-Bass.
- Light, P. 1998. *Sustaining Innovation: Creating Nonprofit and Government Organizations that Innovate Naturally*. San Francisco: Jossey Bass.
- Likert, R. 1967. *The Human Organization*. New York: McGraw-Hill.
- Locke, E.A. and Latham, G.P. 1990. *A Theory of Goal Setting and Task Performance*. Upper Saddle River: Prentice Hall.

- Locke, E. A. and Latham, G. P. 2004. "What Should We Do About Motivation Theory? Six Recommendations for the Twenty-First Century." *Academy of Management*, 29: 388-403.
- Long, J.S. 1997. *Regression Methods for Categorical and Limited Dependent Variables*. Sage: Thousand Oaks.
- Long, J.S. and Freese, J. 2005. *Regression Models for Categorical Dependent Variables Using Stata*. Second Edition. College Station: Stata Press.
- Manns, C.L. and March, J.G. 1978. "Financial Adversity, Internal Competition, and Curriculum Change in a University." *Administrative Science Quarterly*, 23: 541-552.
- March, J. and Simon, H. 1993. *Organizations*. Second Edition. Cambridge: Blackwell Publishers.
- Matheson, C. 2007. "In Praise of Bureaucracy? A Dissent from Australia." *Administration and Society*, 39: 233-261.
- McGinnis, M.A. and Ackelsberg, M.R. 1983. "Effective Innovation Management: The Missing Link in Strategic Planning?" *Journal of Business Strategy*, 4: 59-66.
- McGregor, D. 1960. *The Human Side of Enterprise*. New York: McGraw-Hill.
- McKelvey, R.D. and Zavoina, W. 1975. "A Statistical Model for the Analysis of Ordinal Level Dependent Variables." *Journal of Mathematical Sociology*, 4:103-20.
- Mintzberg, H. 1979. *The Structuring of Organizations*. Upper Saddle River: Prentice Hall.
- Monge, P.R., Cozzens, M.D. and Contractor, N.S. 1992. "Communication and Motivational Predictors of the Dynamics of Organizational Innovation." *Organization Science*, 3: 250-274.
- Mottaz, C. J. 1985. "The Relative Importance of Intrinsic and Extrinsic Rewards as Determinants of Work Satisfaction." *Sociological Quarterly*, 26: 365-385.
- Nagel, S. S. and Garson, G. D. 1996. *Advances in Social Science and Computers*. Greenwich: JAI Press.
- Nielsen, J. F. and Pedersen, C. P. 2003. "The Consequences and Limits of Empowerment in Financial Services." *Scandinavian Journal of Management*, 19: 63-83.
- Nunnally, J. and Bernstein, I. 1994. *Psychometric Theory*. New York: McGraw-Hill.
- O'Reilly, C. A. and Caldwell, D. F. 1980. "Job Choice: The Impact of Intrinsic and Extrinsic Factors on Subsequent Satisfaction and Commitment." *Journal of Applied Psychology*, 65: 559-565.

- Park, S.M. and Rainey, H.G. 2007. "Antecedents, Mediators, and Consequences of Affective, Normative, and Continuance Commitment: Empirical Tests of Commitment Effects in Federal Agencies." *Review of Public Personnel Administration*, 27: 197-226.
- Perry, J. L., Engbers, T. A. and Jun, So Yun. 2009. "Back to the Future? Performance-Related Pay, Empirical Research, and the Perils of Performance." *Public Administration Review*, 69: 39-51.
- Perry, J.L., Mesch, D. and Paarlberg, L. 2006. "Motivating Employees in a New Governance Era: The Performance Paradigm Revisited." *Public Administration Review*, 66: 505-514.
- Peters, B. G. 1996. *The Future of Governing: Four Emerging Models*. Lawrence: University Press of Kansas.
- Peters, B. G. and Pierre, J. 2000. "Citizens Versus the New Public Manager: The Problem of Mutual Empowerment." *Administration and Society*, 32: 9-28.
- Pettigrew, A. M. 1972. "Information Control as a Power Source." *Sociology*, 6: 187-204.
- Podsakoff, P.M., MacKenzie, S. B., Lee, J. and Podsakoff, N. 2003. "Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies." *Journal of Applied Psychology*, 88: 879-903.
- Pollitt, C. 1990. *Managerialism and the Public Services*. Oxford: Blackwell.
- Potterfield, T. A. 1999. *The Business of Employee Empowerment: Democracy and Ideology in the Workplace*. Westport, Connecticut: Quorum Books.
- Rainey, H.G. 2009. *Understanding and Managing Public Organizations*. Fourth Edition. San Francisco: Jossey-Bass.
- Rainey, H.G., Bozeman, B. 2000. "Comparing Public and Private Organizations: Empirical Research and the Power of the a priori." *Journal of Public Administration Research and Theory*, 10: 447-69.
- Ryan, R., and Deci, E. 2000. "Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being." *American Psychologist*, 55: 68-78.
- Salancik, G. R. and Pfeffer, J. 1974. "The Bases and Use of Power in Organizational Decision Making: The Case of a University." *Administrative Science Quarterly*, 19: 453-473.
- Spreitzer, G.M. 1995. "Psychological Empowerment in the Workplace: Dimensions, Measurement, and Validation." *Academy of Management Journal*, 38: 1442-1465.
- Spreitzer, G. M. 1996. "Social Structural Characteristics of Psychological Empowerment." *Academy of Management Journal*, 39: 483-504.

- Thomas, K.W. and Velthouse, B.A. 1990. "Cognitive Elements of Empowerment: An 'Interpretive' Model of Intrinsic Task Motivation." *The Academy of Management Review*, 15: 666-681.
- Thompson, J. R. & Sanders, R. P. 1997. "Strategies for Reinventing Federal Agencies." *Public Productivity and Management Review*, 21, 137-155.
- Thompson, V.A. 1965. "Bureaucracy and Innovation." *Administrative Science Quarterly*, 10: 1-20.
- Tjosvold, D. and McNeely, L.T. 1988. "Innovation through Communication in an Educational Bureaucracy." *Communication Research*, 15: 568-581.
- Tosi, H. L. and Carroll, S. J. 1968. "Managerial Reaction to Management by Objectives." *Academy of Management Journal*, 11: 415-426.
- Vroom, V. 1964. *Work and Motivation*. New York: Job Wiley and Sons.
- Wallin, B.A. 1997. "The Need for a Privatization Process: Lessons from Development and Implementation." *Public Administration Review*, 57: 11-20.
- Wanous, J. P., Reichers, A. E. and Hudy, M. J. 1997. "Overall Job Satisfaction: How Good are Single-Item Measures?" *Journal of Applied Psychology*, 82: 247-252.
- Winship, C. and Mare, R.D. 1984. "Regression Models with Ordinal Variables." *American Sociological Review*, 49: 512-25.
- Winters, D. and Latham, G. P. 1996. "The Effect of Learning versus Outcome Goals on a Simple versus a Complex Task." *Group and Organization Management*, 21: 236-250.
- Wise, L. R. 2002. "Public Management Reform: Competing Drivers of Change." *Public Administration Review*, 62: 543-554.
- Wittmer, D. 1991. "Serving the People or Serving for Pay: Reward Preferences among Government, Hybrid Sector, and Business Managers." *Public Productivity and Management Review*, 14, 369-383.
- Wright, B. E. 2007. "Public Service and Motivation: Does Mission Matter?" *Public Administration Review*, 67: 54-64.
- Wright, B. E. and Kim, S. 2004. "Participation's Influence on Job Satisfaction: The Importance of Job Characteristics." *Review of Public Personnel Administration*, 24: 18-40.

Table 1. Descriptive Statistics for Independent and Control Variables

<i>Variable</i>	<i>Mean</i>	<i>St. Dev.</i>	<i>Min.</i>	<i>Max.</i>
<i>practice 1 (providing information about goals and performance)</i>	-0.04	0.85	-2.37	1.50
<i>practice 2 (offering rewards based on performance)</i>	-0.06	0.92	-1.93	1.74
<i>practice 3 (providing access to job related knowledge and skills)</i>	-0.04	0.84	-2.66	1.27
<i>practice 4 (granting discretion to change work processes)</i>	-0.04	0.79	-1.90	1.34
<i>rewards for innovation</i>	3.14	1.13	1	5
<i>job satisfaction</i>	3.70	1.03	1	5
<i>overall performance</i>	4.20	0.78	1	5
<i>knowledge sharing</i>	3.81	1.00	1	5
<i>trust in leader</i>	3.70	1.19	1	5
<i>sufficient resources</i>	3.14	1.21	1	5
<i>location</i>	0.61	0.49	0	1
<i>minority</i>	0.26	0.44	0	1
<i>age</i>	3.34	0.98	1	5

Source: FHCS 2006 dataset; sample size = 189,856.

Note: Sample restricted to 154,793 observations in the multivariate analysis due to missing data.

Table 2. Model Estimates and Tests of Fit, Dependent Variable = Encouragement to Innovate,  $N = 154,793$

<i>Variable Description</i>	<i>Model I: Ordered Logit</i>	<i>Model II: Ordered Probit</i>	<i>Model III: Multinomial Logit</i>	<i>Model IV: Multinomial Logit</i>
<i>overall empowerment approach</i>				-2.244*** (-63.09)
<i>practice 1 (providing information about goals and performance)</i>	-0.024* (-2.21)	-0.013* (-2.23)	-0.020 (-0.71)	
<i>practice 2 (offering rewards based on performance)</i>	-0.389*** (-38.19)	-0.207*** (-36.37)	0.617*** (19.83)	
<i>practice 3 (providing access to job related knowledge and skills)</i>	1.122*** (98.62)	0.606*** (97.58)	-1.680*** (-57.32)	
<i>practice 4 (granting discretion to change work processes)</i>	0.902*** (73.64)	0.499*** (74.06)	-0.804*** (-49.61)	
<i>rewards for innovation</i>	0.695*** (84.09)	0.382*** (84.20)	-1.683*** (-58.05)	-1.294*** (-50.68)
<i>job satisfaction</i>	0.166*** (22.71)	0.095*** (23.30)	-0.269*** (-14.59)	-0.425*** (-24.09)
<i>overall performance</i>	0.147*** (17.96)	0.086*** (18.60)	-0.166*** (-8.12)	-0.225*** (-11.35)
<i>knowledge sharing</i>	-0.032*** (-5.20)	-0.019*** (-5.40)	0.124*** (8.08)	0.124*** (8.08)
<i>trust in leader</i>	0.326*** (53.13)	0.179*** (52.90)	-0.507*** (-32.27)	-0.485*** (-31.83)
<i>sufficient resources</i>	-0.004 (-0.83)	0.002 (0.84)	-0.023 (-1.58)	-0.062*** (-4.32)
<i>location (1=field office)</i>	-0.193*** (-18.51)	-0.113*** (-18.88)	0.327*** (9.73)	0.299*** (9.12)
<i>minority (1 = nonwhite)</i>	0.076*** (6.54)	0.049*** (7.39)	-0.233*** (-6.28)	-0.211*** (-5.84)
<i>age category</i>	0.013** (2.59)	0.009** (2.96)	-0.063** (-3.67)	-0.047** (-2.82)
<i>AIC</i>	312,501.6	314,647.9	312,262.4	332,906.3
<i>BIC</i>	312,670.8	314,817.0	312,819.6	323,344.1
<i>BIC'</i>	-133,356.4	-131,210.1	-133,207.5	-122,683.1
<i>Likelihood Ratio <math>X^2</math></i>	133,511.7	131,365.5	133,828.9	123,161.1
<i>McFadden's <math>R^2</math></i>	0.299	0.295	0.300	0.276
<i>ML (Cox-Snell) <math>R^2</math></i>	0.578	0.572	0.579	0.549
<i>McKelvey and Zavoina's <math>R^2</math></i>	0.624	0.625	---	---
<i>Cragg-Uhler's (Nagelkerke) <math>R^2</math></i>	0.612	0.606	0.613	0.581

\* $p < 0.05$  \*\* $p < 0.01$  \*\*\* $p < 0.001$

Table 3. Logit Coefficients for Model III MNLM Specification, Dependent Variable = Encouragement to Innovate

Comparison	Statistic	Logit Coefficient for Empowerment Practices			
		<i>practice 1</i> (providing information about goals and performance)	<i>practice 2</i> (offering rewards based on performance)	<i>practice 3</i> (providing access to job related knowledge and skills)	<i>practice 4</i> (granting discretion to change work processes)
SD A	$\beta_{SD A}$	-0.020	0.617	-1.680	-1.804
	$\exp(\beta_{SD A})$	0.980	1.853	0.186	0.165
	<i>z</i>	-0.710	19.825	-57.317	-49.611
	<i>p</i>	0.478	0.001	0.001	0.001
D A	$\beta_{D A}$	-0.009	0.427	-1.021	-1.146
	$\exp(\beta_{D A})$	0.991	1.533	0.360	0.318
	<i>z</i>	-0.461	22.494	-51.892	-53.125
	<i>p</i>	0.645	0.001	0.001	0.001
N A	$\beta_{N A}$	0.003	0.233	-0.597	-0.569
	$\exp(\beta_{N A})$	1.003	1.262	0.551	0.566
	<i>z</i>	0.205	15.563	-36.135	-33.006
	<i>p</i>	0.838	0.001	0.001	0.001
SA A	$\beta_{SA A}$	-0.125	-0.359	1.508	0.579
	$\exp(\beta_{SA A})$	0.882	0.698	4.519	1.784
	<i>z</i>	-6.912	-21.988	67.057	27.235
	<i>p</i>	0.001	0.001	0.001	0.001
Comparison	Statistic	Logit Coefficient for Select Control Variables			
		<i>rewards for innovation</i>	<i>job satisfaction</i>	<i>trust in leader</i>	
SD A	$\beta_{SD A}$	-1.683	-0.269	-0.507	
	$\exp(\beta_{SD A})$	0.186	0.764	0.602	
	<i>z</i>	-58.054	-14.595	-32.265	
	<i>p</i>	0.001	0.001	0.001	
D A	$\beta_{D A}$	-0.927	-0.144	-0.351	
	$\exp(\beta_{D A})$	0.396	0.866	0.704	
	<i>z</i>	-60.565	-11.340	-33.620	
	<i>p</i>	0.001	0.001	0.001	
N A	$\beta_{N A}$	-0.416	-0.107	-0.175	
	$\exp(\beta_{N A})$	0.659	0.899	0.840	
	<i>z</i>	-35.594	-9.946	-20.032	
	<i>p</i>	0.001	0.001	0.001	
SA A	$\beta_{SA A}$	0.340	0.353	0.395	
	$\exp(\beta_{SA A})$	1.491	1.287	1.484	
	<i>z</i>	30.466	17.829	32.625	
	<i>p</i>	0.001	0.001	0.001	

Note: a)  $\beta$  is a logit coefficient; b)  $\exp(\beta)$  is a factor change; c) *z* is a *z* –statistic; d) *p* is a significance level. Motivation to Innovate (five-choice outcome): SD = “strongly disagree”, D = “disagree”, N = “neither agree nor disagree”, A = “agree”, and SA = “strongly agree”.

\**p* < 0.05    \*\**p* < 0.01    \*\*\**p* < 0.001

Table 4. Discrete Change in the Probability of Encouragement to Innovate for Model III MNLM Specification (All Other Variables Held at Mean Values)

Variable	Change	$\bar{\Delta}$ mean	SD	D	N	SA	A
Overall	$P(\hat{Y})$ at mean	---	0.002	0.074	0.261	0.079	0.584
<i>practice 1 (providing information about goals and performance)</i>	$\Delta$ Range	0.01	-0.00	0.00	0.01	-0.04	0.02
	$\Delta 1$	0.00	-0.00	0.00	0.00	-0.01	0.01
	StD $\Delta$	0.00	-0.00	0.00	0.00	-0.01	0.00
<i>practice 2 (offering rewards based on performance)</i>	$\Delta$ Range	0.10	0.00	0.10	0.15	-0.13	-0.13
	$\Delta 1$	0.03	0.00	0.03	0.04	-0.03	-0.04
	StD $\Delta$	0.03	0.00	0.02	0.04	-0.03	-0.03
<i>practice 3 (providing access to job related knowledge and skills)</i>	$\Delta$ Range	0.28	-0.05	-0.33	-0.31	0.44	0.26
	$\Delta 1$	0.08	-0.00	-0.07	-0.12	0.14	0.06
	StD $\Delta$	0.07	-0.00	-0.06	-0.10	0.11	0.05
<i>practice 4 (granting discretion to change work processes)</i>	$\Delta$ Range	0.22	-0.03	-0.29	-0.24	0.18	0.36
	$\Delta 1$	0.07	-0.00	-0.07	-0.10	0.06	0.11
	StD $\Delta$	0.05	-0.00	-0.06	-0.08	0.05	0.09
<i>rewards for innovation</i>	$\Delta$ Range	0.21	-0.04	-0.27	-0.21	0.17	0.35
	$\Delta 1$	0.05	-0.00	-0.06	-0.07	0.04	0.09
	StD $\Delta$	0.06	-0.00	-0.06	-0.08	0.04	0.10
<i>job satisfaction</i>	$\Delta$ Range	0.05	-0.00	-0.04	-0.09	0.07	0.06
	$\Delta 1$	0.01	-0.00	-0.01	-0.02	0.02	0.01
	StD $\Delta$	0.01	-0.00	-0.01	-0.02	0.02	0.01
<i>trust in leader</i>	$\Delta$ Range	0.10	-0.01	-0.11	-0.13	0.11	0.13
	$\Delta 1$	0.02	-0.00	-0.02	-0.03	0.03	0.02
	StD $\Delta$	0.03	-0.00	-0.03	-0.04	0.04	0.03

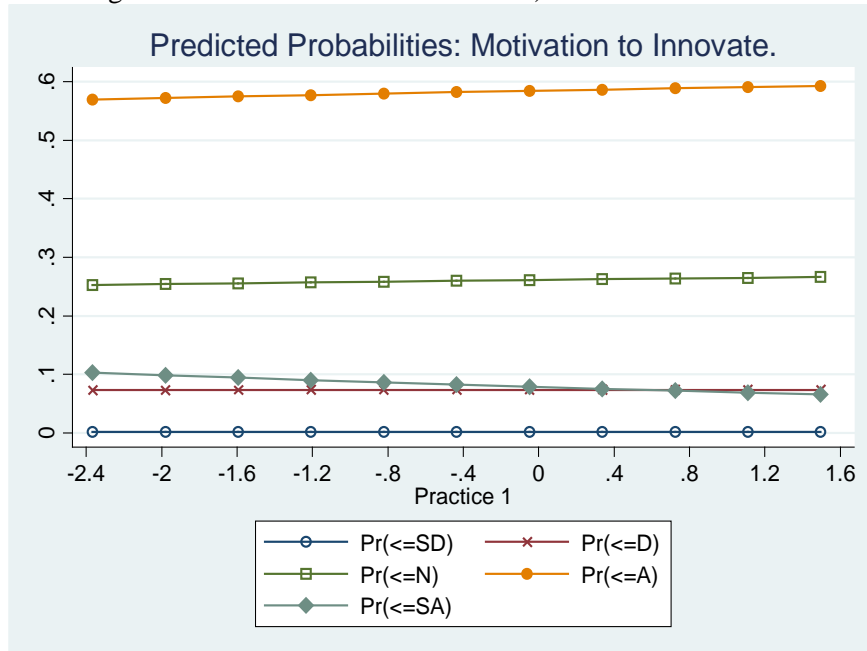
*Note:* a)  $\bar{\Delta}$  mean: is the average absolute discrete change; b)  $\Delta$  Range is change from the minimum to the maximum; c)  $\Delta 1$  is centered change of 1 around the mean; d) StD $\Delta$  is centered marginal change around the mean. Motivation to Innovate (five-choice outcome): SD = “strongly disagree”, D = “disagree”, N = “neither agree nor disagree”, A = “agree”, and SA = “strongly agree”.

Table 5. Discrete Change in the Probability of Encouragement to Innovate for MNLM Specification, Six Two-Way Interactions (All Other Variables Held at Mean Values)

Variable	Change	$\bar{\Delta}$ mean	SD	D	N	SA	A
<i>practice 1 × practice 2</i>	$\Delta 1$	0.00	0.00	0.01	-0.01	0.00	0.00
	StD $\Delta$	0.00	0.00	0.00	-0.01	0.00	0.00
<i>practice 1 × practice 3</i>	$\Delta 1$	0.02	0.00	0.00	-0.01	0.05	-0.04
	StD $\Delta$	0.02	0.00	0.00	-0.01	0.05	-0.04
<i>practice 1 × practice 4</i>	$\Delta 1$	0.02	0.00	0.00	-0.04	0.03	0.01
	StD $\Delta$	0.01	0.00	0.00	-0.03	0.02	0.01
<i>practice 2 × practice 3</i>	$\Delta 1$	0.02	0.00	-0.01	-0.02	0.04	-0.01
	StD $\Delta$	0.02	0.00	-0.01	-0.02	0.04	-0.01
<i>practice 2 × practice 4</i>	$\Delta 1$	0.01	0.00	-0.01	-0.02	0.01	0.01
	StD $\Delta$	0.01	0.00	0.00	-0.02	0.01	0.01
<i>practice 3 × practice 4</i>	$\Delta 1$	0.02	0.00	-0.01	-0.04	0.03	0.02
	StD $\Delta$	0.02	0.00	-0.01	-0.03	0.03	0.02

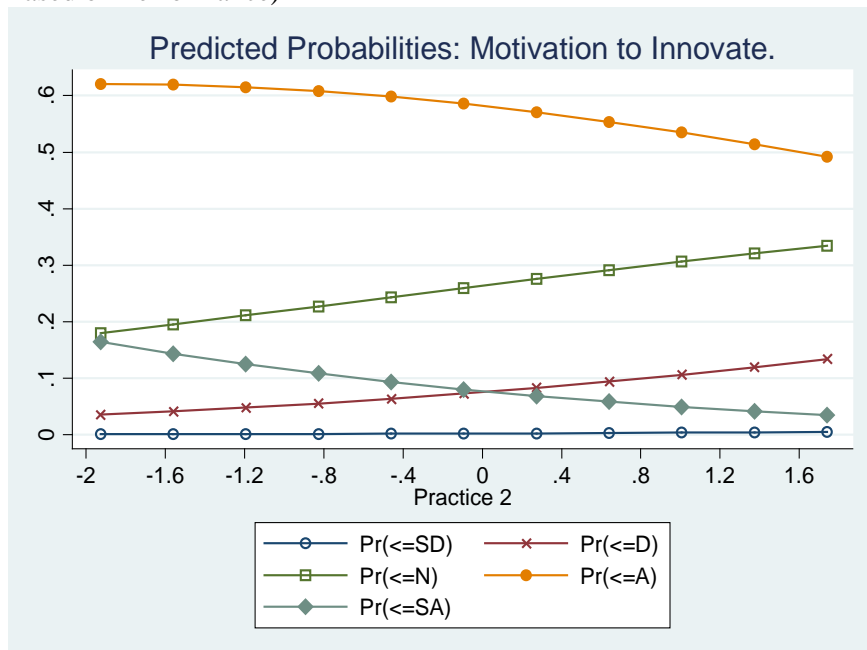
*Note:* a)  $\bar{\Delta}$  mean: is the average absolute discrete change; b)  $\Delta$  Range is change from the minimum to the maximum; c)  $\Delta 1$  is centered change of 1 around the mean; d) StD $\Delta$  is centered marginal change around the mean. Motivation to Innovate (five-choice outcome): SD = “strongly disagree”, D = “disagree”, N = “neither agree nor disagree”, A = “agree”, and SA = “strongly agree”.

Figure 1. Predicted Levels of Encouragement to Innovate, Empowerment Practice 1 (Providing Information about Organizational Goals and Performance)



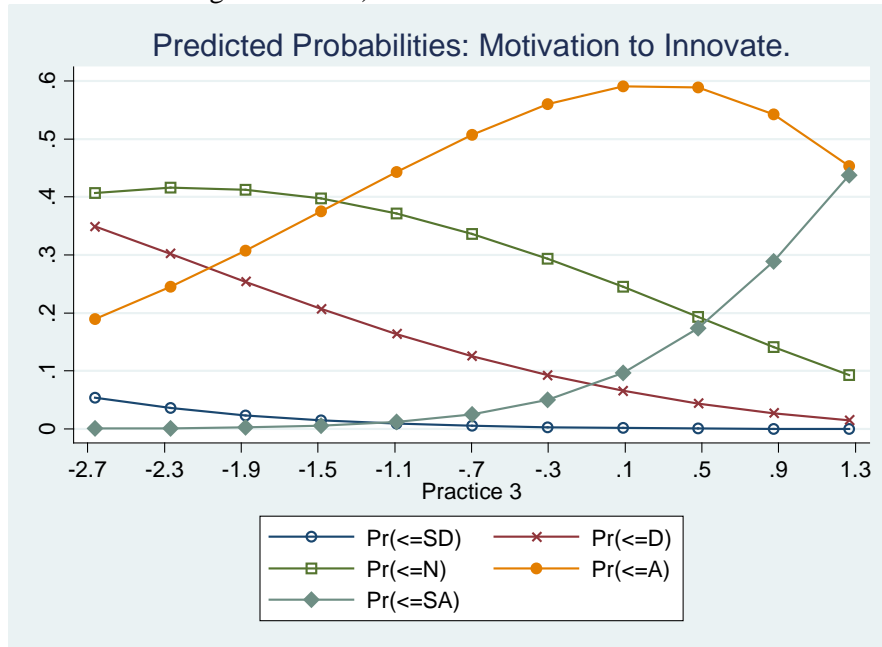
Note: Response categories for outcome variable are labeled SD = “strongly disagree”, D = “disagree”, N = “neither agree nor disagree”, A = “agree”, and SA = “strongly agree”

Figure 2. Predicted Levels of Encouragement to Innovate, Empowerment Practice 2 (Offering Rewards Based on Performance)



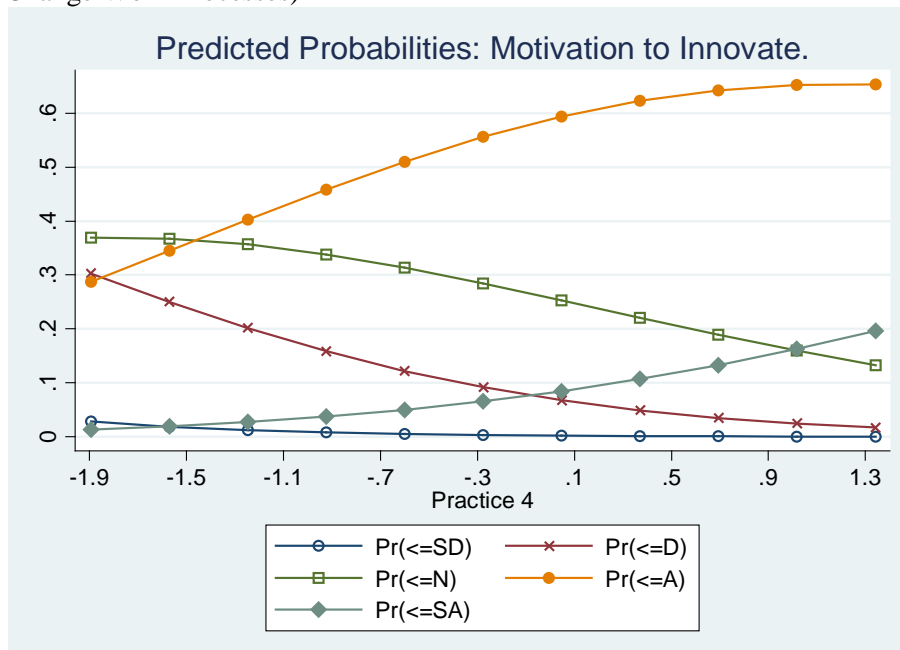
Note: Response categories for outcome variable are labeled SD = “strongly disagree”, D = “disagree”, N = “neither agree nor disagree”, A = “agree”, and SA = “strongly agree”

Figure 3. Predicted Levels of Encouragement to Innovate, Empowerment Practice 3 (Providing Access to Job Related Knowledge and Skills)



Note: Response categories for outcome variable are labeled SD = “strongly disagree”, D = “disagree”, N = “neither agree nor disagree”, A = “agree”, and SA = “strongly agree”

Figure 4. Predicted Levels of Encouragement to Innovate, Empowerment Practice 4 (Granting Discretion to Change Work Processes)



Note: Response categories for outcome variable are labeled SD = “strongly disagree”, D = “disagree”, N = “neither agree nor disagree”, A = “agree”, and SA = “strongly agree”

## Appendix 1. Measures for Employee Empowerment Practices

---

### *practice 1 (providing information about goals and performance)*

#### Survey indicators

- I1. Managers review and evaluate the organization's progress toward meeting its goals and objectives. (1 = strongly disagree through 5 = strongly agree).
- I2. Supervisors/team leaders provide employees with constructive suggestions to improve their job performance. (1 = strongly disagree through 5 = strongly agree)
- I3. How satisfied are you with the information you receive from management on what's going on in your organization? (1 = very dissatisfied through 5 = very satisfied)

Cronbach's alpha test, mean interval covariance = 0.62

Cronbach's alpha test, scale reliability coefficient = 0.80

---

### *practice 2 (offering rewards based on performance)*

#### Survey indicators

- I4. Promotions in my work unit are based on merit. (1 = strongly disagree through 5 = strongly agree)
- I5. Employees are rewarded for providing high quality products and services to customers. (1 = strongly disagree through 5 = strongly agree)
- I6. Pay raises depend on how well employees perform their jobs. (1 = strongly disagree through 5 = strongly agree)
- I7. Awards in my work unit depend on how well employees perform their jobs. (1 = strongly disagree through 5 = strongly agree)

Cronbach's alpha test, mean interval covariance = 0.87

Cronbach's alpha test, scale reliability coefficient = 0.88

---

### *practice 3 (providing access to job related knowledge and skills)*

#### Survey indicators

- I8. I am given a real opportunity to improve my skills in my organization. (1 = strongly disagree through 5 = strongly agree)
- I9. The workforce has the job-relevant knowledge and skills necessary to accomplish organizational goals. (1 = strongly disagree through 5 = strongly agree)
- I10. Supervisors/team leaders in my work unit support employee development. (1 = strongly disagree through 5 = strongly agree)

Cronbach's alpha test, mean interval covariance = 0.49

Cronbach's alpha test, scale reliability coefficient = 0.74

---

### *practice 4 (granting discretion to change work processes)*

#### Survey indicators

- I11. Employees have a feeling of personal empowerment with respect to work processes. (1 = strongly disagree through 5 = strongly agree)
- I12. How satisfied are you with your involvement in decisions that affect your work? (1 = very dissatisfied through 5 = very satisfied)

Cronbach's alpha test, mean interval covariance = 0.74

Cronbach's alpha test, scale reliability coefficient = 0.77

---

Note: Mean internal covariance, also known as average inter-item correlation, is a statistic used to assess the reliability of a scale. Conventionally, if this statistic is greater than 0.6, then item standardization and index construction is justified (Nagel and Garson, 1996), although when theory justifies it, lower scores of this measure may be selected if the scale reliability coefficient is greater than 0.7 (Nunnally and Bernstein, 1994). It is also a common practice to view a scale reliability coefficient greater than 0.7 as an indicator that the scale index is reliable.

## Appendix 2. Measures for Control Variables

---

### *rewards for innovation*

“Creativity and innovations are rewarded.” (1 = strongly disagree through 5 = strongly agree)

### *job satisfaction*

“Considering everything how satisfied are you with your job?” (1 = very satisfied through 5 = very dissatisfied)

### *overall performance*

“How would you rate the overall quality of work done by your work group?” (1 = very poor through 5 = very good)

### *knowledge sharing*

“Employees share job knowledge with each other.” (1 = strongly disagree through 5 = strongly agree)

### *trust in leader*

“I have trust and confidence in my supervisor.” (1 = strongly disagree through 5 = strongly agree)

### *sufficient resources*

“I have sufficient resources to get my job done.” (1 = strongly disagree through 5 = strongly agree)

### *location*

Respondent’s work location. (1 = field office, 0 = headquarters)

### *minority*

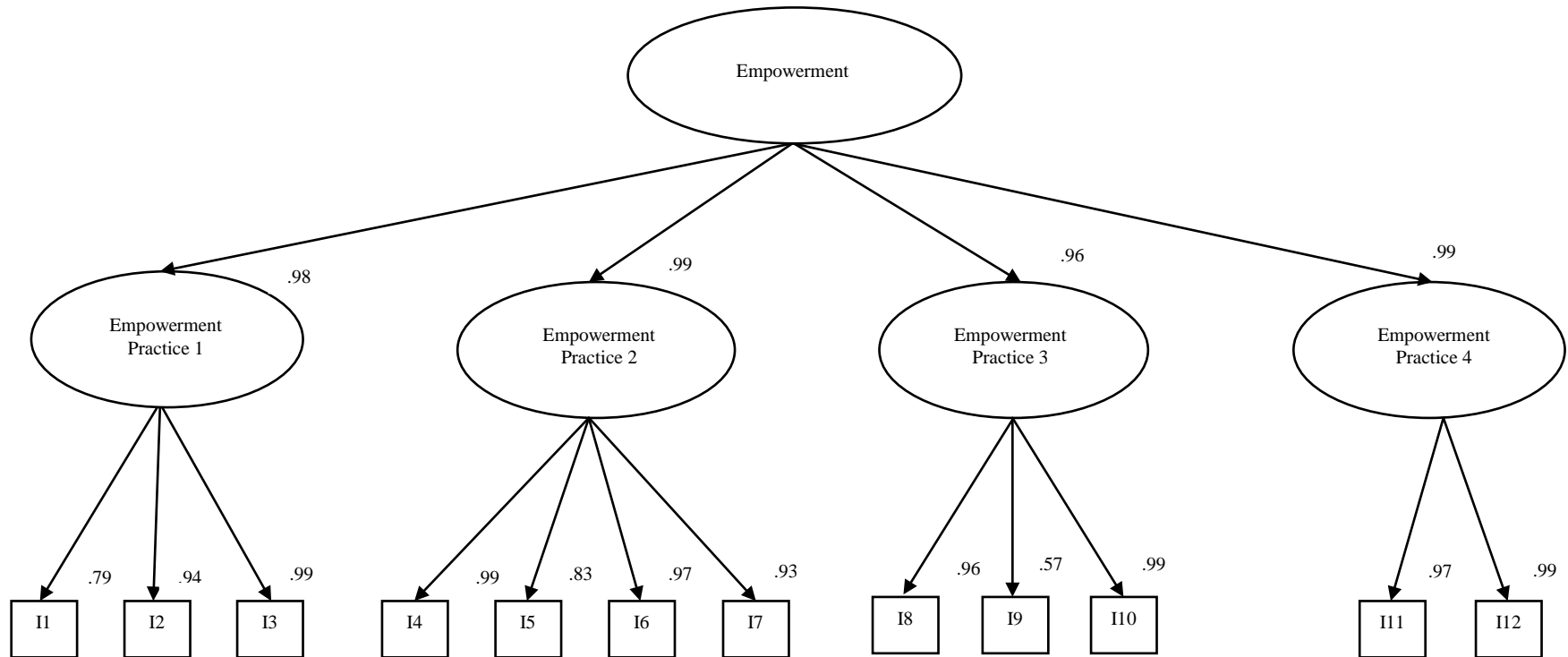
Respondent’s race. (1 = nonwhite, 0 = white)

### *age*

Respondent’s age. (1 = 26-29; 2 = 30-39; 3 = 40-49; 4 = 50-59; 5 = 60-69)

---

Appendix 3. Higher-Order Confirmatory Factor Analysis, Employee Empowerment



Comparative Fit Index (CFI) = 0.94 Normed Fit Index (NFI) = 0.94 Joreskog and Sorbom Goodness-of-Fit Index (GFI) = 0.93

Root Mean Square Error of Approximation (RMSEA) = 0.09 Parsimony Ratio (PRATIO) = 0.76 Parsimony Normed Fit Index (PNFI) = 0.71

Standardized Root Mean Square Residuals (Stand RMR) = 0.04

Note: Factor loadings shown are standardized factor loadings.

## Notes

---

<sup>1</sup> Impact refers to the extent to which behavior is seen to make a difference as to whether or not a task will be accomplished. Competence refers to self-efficacy or “the degree to which a person can perform task activities skillfully when he or she tries” (Thomas and Velthouse, 1990, p. 672). Meaningfulness is conceived in terms of how much value an employee places on accomplishing the task. Finally, choice is defined as locus of causality, referring to “the issue of whether a person’s behavior is perceived as self-determined” (Thomas and Velthouse, 1990, p. 673).

<sup>2</sup> Budget constraints and inadequate funding of pay-for-performance schemes in the public sector have resulted in reduced employee expectancy of receiving financial rewards and the valence attached to such rewards (Kellough and Nigro, 2002; Kellough and Lu, 1993; Heinrich, 2007).

<sup>3</sup> A higher-order confirmatory factor analysis (CFA) was performed to assess the measurement of Bowen and Lawler’s four-dimensional empowerment construct. Multiple ordinal survey items shown in Appendix 1 were used to measure the four empowerment practices. In the four-dimensional model shown in Appendix 3, each of the survey items loaded strongly and in the anticipated direction with the corresponding factor (i.e., empowerment practice) ( $p < 0.001$ ). Those four factors, in turn, have very strong positive correlations with a second-order factor representing the underlying construct of employee empowerment ( $p < 0.001$ ). The statistics for several goodness-of-fit indices support the four-factor model of empowerment. The statistic for the comparative fit index (CFI), which is minimally affected by sample size, is 0.94, indicating a good fit for the four-factor model (Fan, Thompson, and Wang, 1999). The Joreskog and Sorbom goodness-of-fit index of 0.93 also suggests a good model fit. The normed fit index (NFI) statistic of 0.94 and the root mean square error of approximation (RMSEA) of 0.09 both point to an acceptable fit for the four-factor model (Schumacker and Lomax, 2004). Complex models are more likely to generate better fit statistics than parsimonious ones. It is recommended, therefore, that models be subjected to goodness of fit measures that penalize for lack of parsimony. The model with a four-factor structure has parsimony ratio (PRATIO) and parsimony normed fit index (PNFI) statistics of 0.76 and 0.71, respectively, both of which are indicative of a reasonably parsimonious fit. It should be noted that the chi square test results reject the four-factor model (67,091,  $n = 154,793$ , 50 degrees of freedom) at the  $p < 0.01$  level. Large sample sizes like the one used in this CFA are much more likely to result in Type II errors. Garson (2009) suggests, therefore, discounting the chi square results if other fit statistics support a model with such a large sample size. In contrast to the evidence favoring a four-factor model of employee empowerment, the higher-order CFA results reject a model with a one-factor structure. The CFI and NFI statistics for a one-factor model fail to reach the 0.90 cutoff point; both are only 0.89. And the RMSEA statistic (0.12) is above the conventional cutoff for even an adequate model fit (Schumacker and Lomax, 2004). In addition, a comparison of the four-factor and one-factor models, in terms of their Akaike information criterion (AIC) statistics, favors the former over the latter. The lower AIC statistic for the four-factor model (67,147.25) is considerably lower than the AIC statistic for the one-factor model (125,414.95), indicating a significantly better model fit (Burnham and Anderson, 2004; Long, 1997). Finally, the absolute value of the difference in chi-squares between the four-factor model (chi-square = 67,091,  $n = 154,793$ , 50 degrees of freedom) and one-factor model (chi-square = 125,367,  $n = 154,793$ , 54 degrees of freedom) is 58,276. This is indicative of a statistically significant difference ( $p < 0.001$ ) in support of the four-factor model.

<sup>4</sup> According to Fornell and Larcker (1981), AVEs greater than 0.50 are indicative of convergent validity. The four empowerment practices have AVEs ranging from 0.74 (*practice 3*) to 0.96 (*practice 4*). Discriminant validity is assessed by comparing the square root of the AVE of an empowerment practice to the correlations between that practice and the remaining practices. A square root of an AVE greater than the correlations between an empowerment practice and the remaining practices is indicative of divergent validity. The results show that the square root of AVE is greater than all the relevant correlations for all four empowerment practices, with differences ranging from 0.24 (*practice 4*) to 0.12 (*practice 3*).

<sup>5</sup> A number of federal agencies (e.g., U.S. Department of Agriculture, National Institutes of Health, National Aeronautics and Space Administration, and U.S. Agency for International Development) have employee suggestion programs in which an ad hoc committee evaluates innovative proposals submitted by individuals or groups as they come forth and determines whether or not to grant a reward based on the projected gains in productivity that would be achieved from the adoption of the proposal. Other agencies (e.g., The U.S. Department of Health and Human Services and General Services Administration) have innovation programs that recognize employees who have been able to demonstrate the success of their innovations, in some cases over the course of many years.

<sup>6</sup> An MNLM estimation using the full sample of respondents produces remarkably similar results to those reported above from a truncated sample of only non-supervisory employees, team leaders and supervisors.

---

<sup>7</sup> Since the survey respondents are clustered by agency, the same MNLM was estimated using clustered standard errors and also using a series of agency dummy variables. Doing this failed to have a meaningful effect on the MNLM results in terms of statistical and substantive significance and model fit.

<sup>8</sup> “Agree” was chosen because it is the category with the highest frequency in the dependent variable’s distribution, a common practice when estimating MNLM regression. Almost all statistical packages use the category with the highest frequency as a comparison category by default. The multinomial results in Table 2 (third column) provide important but limited information; the sign of the reported coefficient provides the direction of the effect for a binary comparison of the lowest outcome choice “strongly disagree” to the comparison category “agree.” That is why the results in Tables 3 and 4 are very important. Table 3 provides the coefficients, log-odds and levels of significance for the effects of the four empowerment practices on levels of the dependent variable for all binary comparisons: “strongly disagree”, “disagree”, “neither disagree or agree”, and “strongly agree” vs. “agree”, the comparison choice.