A Causal Model of the Empowerment Process: Exploring the Links between Empowerment Practices, Employee Cognitions, and Behavioral Outcomes

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The intellectual roots of employee empowerment stretch back many decades to the advent of the Human Relations movement in organization theory (Herrenkohl, Judson, and Heffner, 1999). From the 1940s through the 1970s, ideas regarding employee empowerment were treated "at best as interesting fodder for academic debates" (Potterfield, 1999, p. 30) or at worst as "socialism, democracy gone wild, or worse yet, a form of communism" (Lawler, 1986, p. 9). Then beginning in the 1980s, global competition and strong pressure to continuously improve quality led many prominent American firms to adopt employee empowerment programs (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 public sector, employee empowerment figured prominently in the New Public Management reforms undertaken in North America, Europe and the Pacific (Kettl, 2005; Peters, 1996; Wise, 2002; Pollitt, 1990; Matheson, 2007), including in the United States where empowerment was one of the four guiding principles of the Clinton Administration's National Performance Review (Gore, 1993).

A growing body of empirical evidence from the private sector indicates employee empowerment can be used to increase employee productivity, organizational commitment, job satisfaction, and innovativeness (Spreitzer, 1995; Lawler, Mohrman, and Ledford, 1992, 1995; Neilsen and Pedersen, 2003; Kirkman and Rosen, 1999; Guthrie, 2001). Recent public management studies have begun to show the efficacy of empowerment practices at raising levels of job satisfaction and performance and encouraging innovation in the public sector (Wright and Kim, 2004; Kim, 2002; Lee, Cayer, and Lan, 2006; Park and Rainey, 2007; Fernandez and Moldogaziev, 2011). Despite these significant developments in the scholarly study of employee empowerment, divergent views remain about the meaning and nature of the construct. For

scholars who approach the topic from a managerial perspective, employee empowerment is a relational construct describing how those with power in organizations share power and authority with those lacking it (Bowen and Lawler, 1992, 1995; Kanter, 1979). For others, empowerment is a psychological construct akin to increased feelings of self-efficacy (Conger and Kanungo, 1988) and intrinsic task motivation (Thomas and Velthouse, 1990).

In this paper, these two views of empowerment are treated as complementary pieces of the employee empowerment puzzle that represent qualitatively different phenomena: the relational construct representing managerial behavior (i.e., empowerment as something managers do) and the motivational one representing employee cognitions (i.e., empowerment as something employees think or feel). Employee empowerment might best be understood as a *process* involving a set of management practices (sharing authority, resources, information, and rewards with employees) that directly affects work outcomes (quality, productivity, customer satisfaction) and also indirectly affects them by influencing employee cognitions (self-efficacy, motivation, job satisfaction). This hypothesized causal structure is tested using structural equation modeling (SEM) techniques and data from the 2010 Federal Employee Viewpoint Survey (FEVS), a large survey of federal government employees conducted by the U.S. Office of Personnel Management. The results generally support the hypothesized model, showing that an employee empowerment approach to managing employees has a direct effect on performance as well as indirect effects through its impact on innovativeness and performance.

The Employee Empowerment Construct

The origins of the empowerment construct can be traced back to the early and middle part of the 20th century, when scholars began dealing with issues of power and the benefits of sharing power with lower level employees. These early studies of power in organizations square with

the view of empowerment as a relational construct, with empowerment being something managers do or a set of practices they engage in. Follett (1926) asserted that behavior can be changed more effectively when a supervisor and a subordinate work together to study and resolve a problem. As she explained, the former should not give orders to the latter, but both should agree to take their orders from the situation. Likert (1967), in his study of what differentiates high from low performing firms, warned that only those firms that adopt a more democratic and participatory management style that expressed empathy for employees would be able to stay on top of their competitors by attracting and retaining skilled and productive workers. McGregor (1960) argued that the antidote to low employee productivity and morale was a management approach aimed at reducing employee dependency on management by granting them more formal authority and the opportunity to perform meaningful work. Argyris (1957) asserted that to satisfy the psychological needs of mature adults, managers would have to promote job enlargement and allow greater responsibility and involvement in decision making.

Kanter's (1979) seminal contribution to the understanding of empowerment was to describe the array of sources of power in organizations. She argued that power comes not solely or even primarily from formal authority, as exercised by the giving of orders. Rather, power emerges from two individual capacities: access to resources, information, and support needed to perform a task; and the ability to obtain the cooperation of subordinates. Her work implies empowerment is more about enabling employees to perform a task than about granting them the authority to act.

Bowen and Lawler's (1992, 1995) analysis of the burgeoning empowerment trend built upon Kanter's notion of empowerment. They acknowledged that a key ingredient of empowerment is sharing power and authority with lower level employees and allowing them to

make decisions about how services are rendered. However, sharing power is insufficient if the benefits of empowerment—including better quality service, greater customer satisfaction, and higher employee job satisfaction—are to be realized. In their research of employee empowerment programs in private firms, Bowen and Lawler observed that "many empowerment programs fail when they focus on 'power' without also redistributing information, knowledge and rewards" (p. 1992, p. 32). According to them, effective use of empowerment involves having managers share with their employees four organizational ingredients: "(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, these four elements interact with each other, having a multiplicative rather than additive effect on performance.

Up until the late 1980s, the treatment of employee empowerment as a relational construct predominated in the literature. Dissatisfaction with that approach led some scholars to emphasize the psychological aspects of empowerment. Conger and Kanungo (1988) were critical of previous empowerment scholars for their tendency to equate empowerment solely with practices aimed at sharing authority with lower-level employees as well as for their failure to account for the critical role played by cognition and affect in explaining performance. Viewing empowerment as a motivational construct, they argued that involving lower-level employees in the decision making process and delegating authority to them does not guarantee they will feel motivated or enabled to act. Instead, empowered employees will exert effort when they believe such effort will result in a desired level of performance (see also Lawler, 1973). This heightened belief in the ability to perform—defined by Bandura (1986) as the self-efficacy expectation—is

influenced as much by feedback, job enrichment, and goal setting as by managers' efforts to share authority with employees.

Inspired by the work of Conger and Kanungo, Thomas and Velthouse (1990) furthered the development of empowerment as a motivational construct by identifying four intrapersonal cognitions that cause employees to experience a feeling of empowerment. Drawing on work redesign theory (Hackman and Oldham, 1976) and expectancy theory (Lawler, 1973), they defined empowerment as a heightened level of intrinsic task motivation or internalized commitment to a task. According to their model, an employee makes personal assessments of four aspects of a task: impact, competence, meaningfulness, and choice. 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 (see also Petter, et al., 2002). Similarly, Spreitzer (1995, 1996) described employee empowerment as a motivational construct evident in four cognitions: meaning, competence, self-determination (Thomas and Velthouse's "choice"), and impact. As she explains, "together, these four cognitions reflect an active, rather than a passive, orientation to a work role. By active orientation, I mean an orientation in which an individual wishes and feels able to shape his or her work role and context" (1995, p. 1444). These four elements of psychological empowerment are argued to work additively to influence employee effectiveness and innovativeness.

Despite these disagreements over the meaning of employee empowerment as a theoretical construct, leading empowerment scholars seem to agree that there is an empowerment process by which managerial interventions influence employee cognitions and behavior resulting in improved performance. Conger and Kanungo (1988), who emphasized the psychological aspects of empowerment, view empowerment as part of a process geared towards "enhancing feelings of

self-efficacy among organizational members through the identification of conditions that foster powerlessness and through their removal by both formal organizational practices and informal techniques of providing efficacy information" (p. 474). In a similar vein, Thomas and Velthouse, who favor the view of empowerment as a psychological construct, acknowledge the effects of deliberative attempts by managers to influence the cognitive assessments leading to an empowered state of mind. Management interventions that promote intrinsic task motivation (i.e., empowerment) include delegation, competence-based pay, work that is meaningful, and a charismatic supervisory style.

Central to Spreitzer's (1995) model of psychological empowerment are a set of antecedents—locus of control, self-esteem, access to information, and rewards—that are said to influence the four cognitions evincing empowerment. In proposing these antecedents, Spreitzer has suggested that for psychological empowerment to occur, some of the ingredients from Bowen and Lawler's empowerment approach—including providing information about organizational goals and performance, granting discretion, and offering rewards based on performance—must take place first. Essentially, she is redefining the relational construct of empowerment as a set of practices that trigger or bring about psychological empowerment.

A Model of the Empowerment Process

A theoretical model of the employee empowerment process is described in this section. Employee empowerment is conceived of as a set of four management practices (sharing authority, resources, information, and rewards with employees) identified by Bowen and Lawler. Employee empowerment should have a direct effect on performance. It should also indirectly affect performance by influencing employee innovativeness and job satisfaction, both of which

will affect performance. Each of the links in this hypothesized causal structure is described below (see Figure 1).

Empowerment and Performance

An employee empowerment approach—defined by Bowen and Lawler (1992, 1995) as a set of practices aimed at sharing information, rewards, job related knowledge, and authority with employees—should have a direct positive effect on performance. The added discretion granted to empowered employees provides them with the flexibility to adapt to unforeseen circumstances, to improve the quality of interactions with service recipients, and to make more productive use of their time (Bowen and Lawler, 1992, 1995; Langbein, 2000). Discretion is particularly important for performance as task complexity and environmental turbulence increase (see Burns and Stalker, 1961; Landau and Stoudt, 1979), since these conditions place a premium on the ability to adapt. Empowerment also enhances the technical knowledge and capabilities of employees, enabling them to perform tasks more effectively (Bowen and Lawler, 1992, 1995; Lawler, Mohrman and Ledford, 1995). Goal setting and feedback, activities emphasized in an empowerment approach, also have a significant bearing on employee effort and performance. A wide range of studies have shown that setting goals, especially more challenging ones, results in increased effort and persistence in the face of setbacks (see Locke and Latham, 1990; Latham and Locke, 1991). More specific goals also focus effort in the desired direction by communicating priorities to employees. Performance feedback alerts employees of errors and can include suggestions for correcting such errors.

--- Insert Figure 1 about here ---

Empowerment and Innovativeness

Empirical evidence exists of strong relationships between the empowerment practices described by Bowen and Lawler and innovativeness, including both encouragement to innovate and actual innovative behavior. Granting discretion to employees is particularly important for initiation of innovation, as it provides autonomy to act in new and creative ways that depart from standard operating procedures (Pierce and Delbecq, 1977; Kanter, 1982; Fernandez and Mondogaziev, 2011). Training and development can serve as channels for the diffusion of innovations, as employees learn about and introduce ideas applied successfully in other organizations. Training and development improves an employee's ability to diagnose and solve technical problems (Hurley and Hult, 1998; Damanpour, 1991; Thompson, 1965; Katz and Tushman, 1981), thus increasing the odds that innovative proposals will be designed and implemented successfully (McGinnis and Ackelsberg, 1983; Dewar and Dutton, 1986). Goal-setting conveys organizational priorities and encourages achievement-oriented employees to seek out or invent new strategies and tactics for attaining those goals. Importantly, negative feedback indicative of failure induces search for innovative solutions to problems (Cyert and March, 1963; Manns and March, 1978; Fernandez and Wise, 2010).

Empowerment and Job Satisfaction

Large scale longitudinal studies conducted during the 1990s showed that empowerment and high involvement management practices are effective and increasing employee job satisfaction (Lawler, Mohrman, and Ledford, Jr., 1992; 1995). Several studies on the use of empowerment in public organizations indicate an employee empowerment approach is among the strongest predictors of job satisfaction among public employees (Lee, Cayer and Lan, 2006; Wright and Kim, 2004). Kim and Wright (2004) suggest this effect is indirect, so that

empowerment increases job satisfaction through further development and growth opportunities, increased task significance, and increased communication and feedback. Empowerment practices are designed to incentivize employees through the introduction of different intrinsic (feedback, autonomy) and extrinsic rewards (merit-based pay, training opportunities). Research based on the job characteristics model (Oldham and Hackman, 1976) has shown consistently strong correlations between intrinsic job characteristics and job satisfaction and other employee attitudes, particularly when subjective measures of intrinsic job characteristics are used (Fried and Ferris, 1987; Glick, Jenkins and Gupta, 1986; Glisson and Durick, 1988). The general argument is that jobs that are intrinsically rewarding increase employee satisfaction by enriching their work, making it more challenging and fulfilling (Oldham and Hackman, 1976).

Intrinsic job characteristics appear to have a stronger impact on job satisfaction than extrinsic rewards (Deci, 1972; O'Reilly and Caldwell, 1980; Mottaz, 1985; Judge, et al., 1998). This is not to suggest, however, that introducing extrinsic rewards such as merit based pay, a key empowerment practice, will not improve job satisfaction. Indeed, a large body of research shows pay and other extrinsic rewards can 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 sector employees with higher levels of public service motivation (Rainey, 1982; Wittmer, 1991; Wright, 2007; Alonso and Lewis, 2001; Perry, Mesch, and Paarlberg, 2006).

Innovativeness and Performance

In a dynamic external environment, more adaptable organizations capable of undergoing changes in function and form tend to perform better and are more likely to survive. Innovation represents a vital form of organizational learning and adaptation (Simon 1997). Product and

technological innovations continue to be key sources of performance improvement and competitive advantage for private sector firms (Porter, 1985; Christensen, 1997; Fagerberg, Mowery and Nelson, 2006). New Public Management reforms, especially those undertaken in the United States, Australia and the United Kingdom, has stressed innovation as a way to improve public sector performance (Gore, 1993; Kettl, 2005; Kamensky, 1996; Breul and Kamensky, 2008; Bartos, 2003; O'Flynn, 2007; Australian National Audit Office, 2009; Pollitt and Bouckaert, 2004). The importance of innovation has prompted governments in those and other countries to develop separate appraisal and reward systems that operate in parallel to annual performance appraisal and merit pay systems in order to evaluate the efficacy of innovative ideas and reward employees for developing them (Fernandez and Pitts, 2011 forthcoming). The benefits of organizational change and innovation are not always realized, however, as many innovative ideas are poorly conceived or fail during their implementation (Hartley, 2005). Organizational change can be very disruptive, adversely affecting performance to the point of organizational decline and death (Amburgey, Kelly and Barnett, 1993). In short, the impact of innovativeness on performance should be positive in the long-term but marginal or even negative in the short-term until new processes can be learned and institutionalized (Fernandez and Rainey, 2006).

The relationship between performance and innovativeness appears to be simultaneous, with poor or substandard performance encouraging innovative behavior. As Cyert and March (1963) argued, "Failure induces search and search ordinarily results in solutions. Consequently, we would predict that, everything else being equal, relatively unsuccessful firms would be more likely to innovate [that is, come up with new solutions to a problem] than relatively successful firms (p. 188)." Research by others supports the notion that necessity is the mother of invention

(Manns and March, 1978; Williamson, 1975; Chandler, 1977; March and Simon, 1993; Fernandez and Wise, 2010; Borins, 2011 forthcoming). The link between poor performance and innovativeness appears to be particularly strong among early adopters of an innovation (Bolton, 1993) and for problem-oriented innovations, which are justifiable in the short run and are linked directly to a problem (Cyert and March, 1963).

Job Satisfaction and Performance

For many decades, job satisfaction and morale have been studied as antecedents of individual performance. The most comprehensive meta-analyses of empirical studies of the job satisfaction-performance relationship show that the two concepts correlate at about the $r = 0.30$ level, with higher correlations for more complex jobs (see Judge, et al., 2001). An earlier meta-analysis indicated that the strength of the job satisfaction-performance relationship varies by aspect of job, with much lower correlations for satisfaction with pay and higher correlations with intrinsic features of the job (Iaffaldano and Muchinsky, 1985). Job satisfaction can directly improve performance by improving levels of energy, activity and creativity and by enhancing memory and analytical abilities (Judge, et al., 2001' Brief and Weiss, 2002; Isen and Baron, 1991). It can also indirectly improve performance by increasing organizational commitment and organizational citizenship behavior and reducing turnover and absenteeism (Judge, et al., 2001; Cooper-Hakim and Viswesvaran, 2005; Dalal, 2005; Harrison, Newman, and Roth, 2006; Meyer, et al., 2002; LePine, Erez and Johnson, 2002).

Measurement, Data and Methods

This section provides a description of variables, data, and statistical techniques used in the empirical analysis.

Variables

The four main variables in the analysis are *empowerment*, *innovativeness*, *job satisfaction*, and *performance*. All four variables are treated as latent variables measured using multiple observable indicators.

Employee empowerment is conceived of as a multi-faceted management approach composed of four practices: providing information about goals and performance; offering rewards based on performance; providing access to job related knowledge and skills; and granting discretion to change work processes (Bowen and Lawler, 1992; 1995). The latent variable *empowerment* is measured using four observable indicators representing the four practices listed above. Each of these observable indicators is in the form of a summated scale created from multiple survey items from the 2010 FEVS. The Cronbach's alphas for these scales range from 0.74 for the practice of providing access to job related knowledge and skills to 0.88 for the practice of offering rewards based on performance. A previously conducted confirmatory factor analysis of this four dimensional definition of employee empowerment showed good levels of both convergent and discriminant validity[i]. All observable indicators used to measure latent variables are shown in Appendix 1.

The latent variable *innovativeness* is measured using two observable indicators from the 2010 FEVS. These two indicators capture both a feeling of encouragement to innovate (see Locke and Latham, 2004) and innovative behavior on the part of the employee.

The latent variable *job satisfaction* is measured using two observable indicators from the 2010 FEVS. These indicators capture overall or global perceptions of job satisfaction with work and not satisfaction with particular aspects of work. Summated rating scales created from indicators of satisfaction with different aspects of work (e.g., pay, benefits, promotional

opportunities) do not correlate very highly with global measures of job satisfaction (e.g., overall satisfaction with job, work, or organization), causing some scholars to question the validity of using such scales to measure overall satisfaction (Judge and Church, 2000).

The latent variable *performance* is measured using two observable indicators from the 2010 FEVS. The indicators are perceptual and internal measures of work unit performance and agency performance in accomplishing its mission. The limitations to using such measures of performance are discussed below.

Data

The data for the analysis are derived from the 2010 Federal Employee Viewpoint Survey (FEVS) conducted by the U.S. Office of Personnel Management (OPM). The 2010 FEVS was administered electronically via the Internet (with limited distribution of paper surveys to those without Internet access) to 504,609 federal government employees at three supervisory levels: non-supervisor/team leader, supervisor, and manager/senior executive. The government-wide response rate was fifty-two percent (N = 263,475). Respondents worked for eighty-one 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 263,475 respondents to the survey, 197,466 or approximately 75% are included in the final analysis, with the remaining observations dropped due to missing data on one or more variables. No meaningful differences were found between observations dropped from the analysis and those that were included.

Model

To test the theoretical model, a structural equation model with the following set of equations is developed. The non-recursive model of the effects of *empowerment* on *innovativeness*, *job satisfaction*, and *performance* has the following structure

Four empowerment practice equations:

$$x_{prct1} = \lambda_{prct1}\xi_{empwrmnt} + \delta_1 \quad (1)$$
$$x_{prct2} = \lambda_{prct2}\xi_{empwrmnt} + \delta_2 \quad (2)$$
$$x_{prct3} = \lambda_{prct3}\xi_{empwrmnt} + \delta_3 \quad (3)$$
$$x_{prct4} = \lambda_{prct4}\xi_{empwrmnt} + \delta_4 \quad (4)$$

Innovativeness equations:

$$y_{NewWays} = \lambda_{NewWays}\eta_{Innovate} + \epsilon_1 \quad (5)$$
$$y_{SrchBttrWays} = \lambda_{SrchBttrWays}\eta_{Innovate} + \epsilon_2 \quad (6)$$

Job satisfaction equations:

$$y_{SatOrg} = \lambda_{SatOrg}\eta_{JobSat} + \epsilon_3 \quad (7)$$
$$y_{SatJob} = \lambda_{SatJob}\eta_{JobSat} + \epsilon_4 \quad (8)$$

Performance equations:

$$y_{WrkUntPerf} = \lambda_{WrkUntPerf}\eta_{Perform} + \epsilon_5 \quad (9)$$
$$y_{AgcyMisnAcclshd} = \lambda_{AgcyMisnAcclshd}\eta_{Perform} + \epsilon_6$$

Measurement models for outcomes:

$$\eta_{Innovate} = \gamma_{empwrmnt}\xi_{empwrmnt} + \beta_{Perform}\eta_{perform} + \zeta_1 \quad (10)$$
$$\eta_{JobSat} = \gamma_{empwrmnt}\xi_{empwrmnt} + \zeta_2 \quad (11)$$
$$\eta_{Perform} = \gamma_{empwrmnt}\xi_{empwrmnt} + \beta_{Innovate}\eta_{Innovate} + \beta_{JobSat}\eta_{JobSat} + \zeta_3 \quad (12)$$

In matrix notation, the set of equations is re-stated as:

$$\mathbf{x} = \mathbf{\Lambda_x}\boldsymbol{\xi} + \boldsymbol{\delta} \quad (13)$$
$$\mathbf{y} = \mathbf{\Lambda_y}\boldsymbol{\eta} + \boldsymbol{\epsilon} \quad (14)$$
$$\boldsymbol{\eta} = \mathbf{B}\boldsymbol{\eta} + \mathbf{\Gamma}\boldsymbol{\xi} + \boldsymbol{\zeta} \quad (15)$$

Model Covariance/Correlation Matrix and the Fitting Function:[ii]

The implied covariance matrix in the model has the components, where:

$$\mathbf{\Sigma_{xx}}(\mathbf{\Theta}) = \mathbf{\Lambda}_x\mathbf{\Phi}\mathbf{\Lambda}_x' + \mathbf{\Theta_\delta} \quad (16)$$
$$\mathbf{\Sigma_{yy}}(\mathbf{\Theta}) = \mathbf{\Lambda}_y(\mathbf{I}-\mathbf{B})^{-1}(\mathbf{\Gamma}\mathbf{\Phi}\mathbf{\Gamma}' + \mathbf{\Psi})[(\mathbf{I}-\mathbf{B})^{-1}]'\mathbf{\Lambda}_y' + \mathbf{\Theta_\epsilon} \quad (17)$$
$$\mathbf{\Sigma_{yx}}(\mathbf{\Theta}) = \mathbf{\Lambda}_y(\mathbf{I}-\mathbf{B})^{-1}\mathbf{\Gamma}\mathbf{\Phi}\mathbf{\Lambda}_x' \quad (18)$$

Bollen (1989, p. 323-326) and Joreskog (1994, p. 298-299) derive mathematically the covariance matrix components in detail. The resulting covariance matrix is then:

$$\boldsymbol{\Sigma}(\boldsymbol{\theta}) = \begin{bmatrix} \boldsymbol{\Lambda}_y(\mathbf{I}-\mathbf{B})^{-1}(\boldsymbol{\Gamma}\boldsymbol{\Phi}\boldsymbol{\Gamma}' + \boldsymbol{\Psi})[(\mathbf{I}-\mathbf{B})^{-1}]'\boldsymbol{\Lambda}_y' + \boldsymbol{\Theta}_{\boldsymbol{\epsilon}} & \boldsymbol{\Lambda}_y(\mathbf{I}-\mathbf{B})^{-1}\boldsymbol{\Gamma}\boldsymbol{\Phi}\boldsymbol{\Lambda}_x' \\ \boldsymbol{\Lambda}_x\boldsymbol{\Phi}\boldsymbol{\Gamma}'(\mathbf{I}-\mathbf{B})^{-1}\boldsymbol{\Lambda}_y' & \boldsymbol{\Lambda}_x\boldsymbol{\Phi}\boldsymbol{\Lambda}_x' + \boldsymbol{\Theta}_{\boldsymbol{\delta}} \end{bmatrix} \quad (19)$$

Generally, estimations of the general structural model for continuous and normally distributed variables are then conducted by the maximum likelihood method (ML)[iii]:

$$F_{ML} = \log|\boldsymbol{\Sigma}(\boldsymbol{\theta})| + \mathrm{tr}[\mathbf{S}\boldsymbol{\Sigma}^{-1}(\boldsymbol{\theta})] - \log|\mathbf{S}| - (p+q) \quad (20)$$

However, the structural model utilizes a set of categorical variables that violate the basic assumption of continuous and normal distribution. Therefore, to obtain unbiased estimates, one must correct for the deficiencies that the linear structural models may not solve. Joreskog (1994) argues that, "Ordinal variables are not continuous variables and should not be treated as if they are. Ordinal variables do not have origins or units of measurement. Means, variances, and covariances of ordinal variables have no meaning. To use ordinal variables in structural equations models requires other techniques than [the latent continuous approach requires]" (p. 303). Moreover, Bollen (1989) specifically warns that the model covariance structure assumptions produce inconsistent estimates of true parameter values when categorical variables are involved. Hence, the structural measurement model is extended to accommodate categorical variables and to be able to report meaningful parameter values.

Consequently, since the covariance structure hypothesis is often violated with categorical variables (Bollen, 1989), instead of the usual Pearson correlation matrix, a polychoric and polyserial correlation matrix is employed to fit the model to the data. The polychoric correlation scores between the categorical variables in the model and the polyserial correlation scores between the categorical and continuous variables in the model are indeed greater than the

Pearson counterparts, as statistical theory predicts. Table 1 provides these correlation scores for all the observed variables in the model. In every instance where a categorical variable is involved, we observe attenuation in Pearson correlation scores. Thus, there is some indication that the covariance structure hypothesis may be violated in the data. Furthermore, categorical variables are more likely to be accompanied by skewness and kurtosis in distribution. Byrne (2009), Muthen and Kaplan (1985), and Bollen (1989) suggest that skewness and kurtosis greater than the absolute value of unity tend to distort the results produced by F_{ML}, which is the traditional method utilized for the continuous and normally distributed variables. Skewness and kurtosis greater than +/- 1 are indeed present in some of the categorical variables in the model. These descriptive statistics for the variables in the model are also provided in Tables 1 and 2.

--- Insert Table 1 about here ---

A two-step procedure is followed to fit the non-recursive structural model of the effects of *empowerment* on *innovativeness*, *job satisfaction*, and *performance* as discussed in Muthen and Kaplan (1985), Bollen (1989), Joreskog (1994), Byrne (2009), and Kline (2011). The first step involves estimating a polychoric/polyserial correlation matrix. This corrected matrix (correction is from the default Pearson scores) is then used in the weighted least squares estimation of the model fit in the second step. Finney and DiStefano (2006) labeled this two-step process the categorical variable methodology (CVM). According to these authors, CVM is then an asymptotically distribution free (ADF) estimator using a WLS approach. The usual caveat, however, is that the CVM must be employed with large sample data; which is not a problem in this study given a sample size of nearly 200,000 observations (see Kline, 2011; Finney and DiStefano, 2006).

Since there are six categorical variables (observable indicators) in the model that are measured on a five-point scale, the thresholds corresponding to the categorical distribution of these variables are also estimated (Joreskog, 1994; Bollen, 1989)[iv]. These thresholds produce a non-linear function that relates the categorical variables to the latent implied variables. Hence, for the *y* variables the non-linear function is:

$$y = \begin{cases} score\ 1\ if\ y^* \leq \tau_1 \\ score\ 2\ if\ \tau_1 < y^* \leq \tau_2 \\ score\ 3\ if\ \tau_2 < y^* \leq \tau_3 \\ score\ 4\ if\ \tau_3 < y^* \leq \tau_4 \\ score\ 5\ if\ \tau_4 < y^* \end{cases} \quad (21)$$

With this function in place and the polychoric/polyserial correlation matrix computed, a structural model can be fitted to the data. This can most easily be achieved by the weighted least squares (WLS) method[v]:

$$F_{WLS} = [\mathbf{r} - \widehat{\boldsymbol{\rho}}]' \mathbf{W}^{-1} [\mathbf{r} - \widehat{\boldsymbol{\rho}}] \quad (22)$$

Results

The results of the non-recursive structural measurement model indicate that the data has a very strong fit to the theoretical framework proposed in this paper[vi]. Most of the hypothesized relationships are supported and are statistically significant. Empowerment has a sizable and highly significant association with all three variables of interest – innovativeness, job satisfaction, and performance. When empowerment goes up by one standard deviation, the measure of job satisfaction goes up by 0.894 standard deviations, ceteris paribus ($z = 444.499; p < 0.001$). Similarly, a one standard deviation increase in empowerment is associated with a 0.762 standard deviation increase in innovativeness, all else constant ($z = 76.249; p < 0.001$). The association between empowerment and performance is the third largest in terms of magnitude of the effect, yet still rather sizable. One standard deviation increase in empowerment is found to have a 0.552

standard deviation increase effect on the measure of performance, all held constant ($z = 66.385; p < 0.001$).

--- Insert Table 2 about here ---

The results of the analysis also suggest that there is a significant and positive association between job satisfaction and performance. When job satisfaction goes up by one standard deviation, performance appears to go up by 0.438 standard deviations, all else equal ($z = 86.744; p < 0.001$). Innovativeness and performance are found to have statistically significant but substantively small reciprocal effects. A one standard deviation increase in innovativeness is associated with a 0.078 standard deviations drop in performance, ceteris paribus ($z = -9.743; p < 0.001$). At the same time, the effect of performance on innovativeness appears to be positive, albeit still not very sizable. The results suggest that when performance goes up by one standard deviation, innovativeness increases by 0.089 standard deviations, all else constant ($z = 8.188; p < 0.001$). Consequently, it may be concluded that innovativeness (performance) has a negative (positive) (dis-) attenuating effect on performance (innovativeness).

--- Insert Table 3 about here ---

The correlation residual and standardized residual matrices are examined next to assess whether the model explains the corresponding sample correlation sufficiently well. Table 4 contains these estimated scores for the variables in the model. None of the unstandardized covariance residuals (absolute values of fitted residuals) are greater than the widely excepted threshold level of 0.10[vii]. Thus, the model implied correlation matrix explains sufficiently well the sample correlation matrix. The choice of utilizing a polychoric/ polyserial correlation matrix (for ordered-ordered/ordered-continuous variables) is well justified.

The various fit statistics for the non-recursive structural model of the effects of empowerment on innovativeness, job satisfaction, and performance indicate a fairly solid model. The Joreskog-Sorbom goodness of fit index (GFI) and the adjusted GFI are greater than the conventional 0.90 threshold, suggesting a strong model fit. Similarly, the Bentler comparative fit index (CFI), the Bentler-Bonner normalized fit index (NFI), and the Tucker-Lewis index (TLI) all achieve the required values of significance greater than 0.90 (See Maruyama, 1998; Schumacker and Lomax, 2004; Kline, 2011). Furthermore, the value of the root mean square residuals is equal to 0.077, which comfortably passes the 0.10 cut-off point for large-sample data sets (see Kline, 2011; Jaccard and Wan, 1996). The standardized root mean square residual index is 0.023, which is also indicative of a strong model fit. Other fit scalars such as the Chi-square statistic or *BIC* are highly significant, thus suggestive of model misfit (33,807 and 33,453 respectively). However, both of these values are a function of sample size. Given the extremely large sample size of almost 200,000 observations used in this study, these last two scalars should not diminish the fit of the model.

--- Insert Table 4 about here ---

The non-recursive structural model was selected from the two other competing (theoretically) recursive models. The first one was a recursive model, similar to the main model, without the feedback loop to innovativeness from performance. The second one was a recursive model that had innovativeness, job satisfaction, and performance as outcomes of empowerment, where the outcomes were assumed to have no causal associations among themselves. Likelihood ratio tests were performed to evaluate these competing models[viii]. The results indicate the non-recursive structural model is the preferred specification. In addition to likelihood ratio tests, the Bayesian Information Criterions (*BIC*) for these models suggest very strongly that the recursive

specifications are inferior to the non-recursive model (see Burnham and Anderson, 2004 or Long, 1997 for *BIC* criterion decisions). The absolute value of difference of *BIC* measures between the non-recursive model and the other two scenarios is significant at $p < 0.001$, thus offering support in favor of a non-recursive model of the effects of empowerment on innovativeness, job satisfaction, and performance.

Discussion and Conclusion

Previous research on employee empowerment in the public sector has examined the link between empowerment practices and various work-related attitudes and performance. These important contributions to the literature have helped to shed light on pieces of the complex puzzle that is employee empowerment. This is the first study, however, to develop and test a model of the employee empowerment process in the public sector, one that accounts for the direct effect of an employee empowerment approach on performance as well as for its indirect effects on performance through employee job satisfaction and innovativeness. The empirical results generally support the theoretical model of the employee empowerment process proposed in this study.

An employee empowerment approach composed of various practices aimed at sharing information, resources, rewards and authority with employees has a direct and sizeable positive effect on performance as perceived by employees. This finding is in line with previous research from the private (Bowen and Lawler, 1992; 1995; Lawler, Mohrman and Ledford, 1992; 1995) and public sectors (Fernandez and Moldogaziev, 2011) that offers evidence of the beneficial effects of empowerment practices on performance. As proposed, it is also found that an employee empowerment approach indirectly affects performance through its influence on job satisfaction and innovativeness. The effect of employee empowerment on job satisfaction is

positive and even stronger than empowerment's direct effect on performance. Job satisfaction, in turn has a positive effect on performance of a magnitude similar to that shown in previous meta-analyses of the relationship between job satisfaction and performance (see Judge, et al., 2001). It appears, then, that by increasing job satisfaction, the use of employee empowerment practices can also result in improved performance, in addition to these practices' direct influence on performance.

The empirical results also show that an employee empowerment approach has a positive and sizeable effect on innovativeness, as was hypothesized. This effect is larger than an employee empowerment's direct effect on performance. Innovativeness in turn has a small negative effect on performance. This is not surprising, given that performance as perceived by employees is measured at the same point in time as innovativeness. As literature on change and innovation indicates, innovativeness can have a negative near term effects on performance, given the start up costs involved in adopting and implementing innovations and the disruptions such changes can cause (see Fernandez and Rainey, 2006). Over the course of time, however, innovativeness' small near term effect might turn into a positive one, as innovation enables an organization to better adapt to the demands and challenges imposed by the external environment. The current study is unable to test for this long term effect, given the limitations posed by cross sectional data. Additional research is needed to explore this relationship longitudinally. In short, this finding suggests that the use of empowerment practices to stimulate innovation will not result in immediate gains in performance, and that managers adopting such an approach must be patient for the creativity sparked by empowerment to bear fruit in the form of performance improvements.

The model was developed to include a simultaneous relationship between innovativeness and performance. Surprisingly, performance has a small positive effect on innovativeness. This suggests that it is success rather than failure that encourages one to become even more innovative. There are several possible explanations for this unexpected finding. It is important to note that nearly 70% of the survey respondents were federal employees low on the organizational hierarchy (i.e., non-supervisors and team leaders). At senior management levels, failure may indeed induce search for solutions, as Cyert and March argued. At the frontlines, however, a mere sign of declining performance may not be enough to induce search, as employees wait for directives from above before undertaking meaningful changes. Also, performance problems may need to be acute before innovation is encouraged. The measures of performance used in this study, however, do not allow one to gauge the seriousness of problems perceived by employees. Finally, the indicators used to measure performance capture work unit and organizational performance and not individual performance. For employees to feel the urge to innovate, their own performance may have to be inadequate and not just that of others around them.

Several limitations to the study point to the need for additional research on employee empowerment in the public sector. As indicated previously, additional research is needed to analyze the effects of empowerment and innovativeness on performance at various points in time, and not just in the near term. Moreover, the model tested here, although it represents an attempt to model the process by which empowerment practices influence cognition and ultimately performance, is a simplified model that leaves out other key cognitions that may be linked to both empowerment practices and performance. Particularly promising would be analyses that estimate the effects of empowerment practices on self-efficacy, organizational

commitment, and public service motivation, three cognitions that have been found to be positively related to performance in the public sector.

Another limitation of the study is the limited number of observable indicators used to measure some of the latent constructs. While most of the conventional fit statistics point to a good model fit, they also suggest room for improvement. In particular, the measurement model could be improved by using additional indicators to measure innovativeness and performance.

One potential limitation is the use of self-reported data gathered from a single survey, a situation that may lead to common method bias. Common method bias is generally believed to produce artificially inflated correlations (Crampton & Wagner, 1994), although in some cases the bias can also deflate correlations (Cote & Buckley, 1988; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The fit statistics indicate a good model fit for the causal model, and a previous confirmatory factor analysis of the empowerment measure indicated an adequate level of discriminant validity. In addition, a simple Harman test of all the indicators in the study results in a multiple factor solution. These results, although not refuting the presence of common method bias, fail to produce convincing evidence that it indeed exists. Crampton and Wagner (1994) concluded that although researchers need to be aware of possible common method biases, overall this problem appears to enjoy an undue level of attention. These authors find that on average the common method bias "is neither dominant nor absent" (Crampton & Wagner, 1994, p. 73). In any event, care should be taken in interpreting the results of this analysis.

Finally, the particular type of measure of performance used in this study—a perceptual and internal measure of performance—raises the question of how closely correlated this type of measure is with other ones, such as more objective measures of performance based on archival records and others that rely on external perceptions or observations. Meta-analyses of the

relationship between perceptual and objective measures of performance show results ranging from a weak correlation between the two types of measures (r = .27, not statistically significant, Heneman, 1986) to higher but still modest correlations (r = .30, Bommer, et al., 1995). In regards to the distinction between internal and external measures of performance, Qalker and Boyne (2006) observed that "a range of evidence demonstrates that there are positive statistically significant correlations between external and internal measures of overall performance, some in the region of r = 0.8" (p. 378). They note, however, that those findings are only achieved when measures of the same dimension of performance are used. Thus, the measure of performance used in this study can serve as a reasonable proxy for other types of measures but is not a substitute for them. Additional research is needed using a variety of measures of performance, including more objective and external ones, as well as measures of performance that capture the different dimensions of performance, like efficiency, effectiveness, and timeliness, which often present public managers with difficult but interesting tradeoffs.

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Figure 1. Causal Model of the Employee Empowerment Process

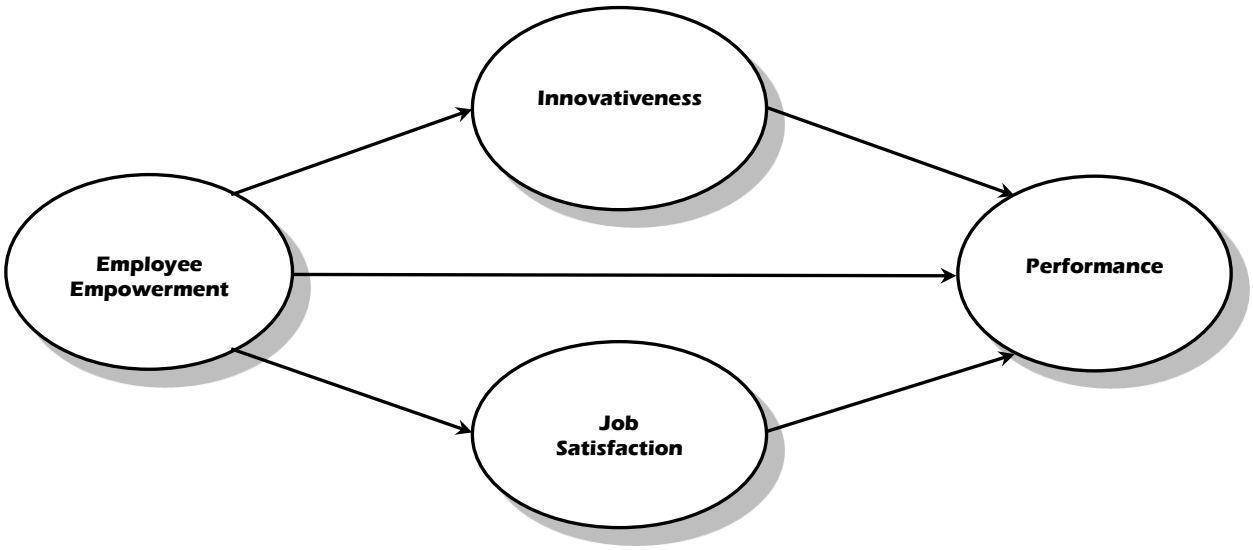

Figure 2. Non-Recursive Structural Model of the Effects of Empowerment on Innovativeness, Job Satisfaction, and Performance; Standardized Coefficients. ADF/WLS Estimation Method using Polychoric/Polyserial Correlation Matrix to Fit the Model to Data. $N = 197{,}446$.

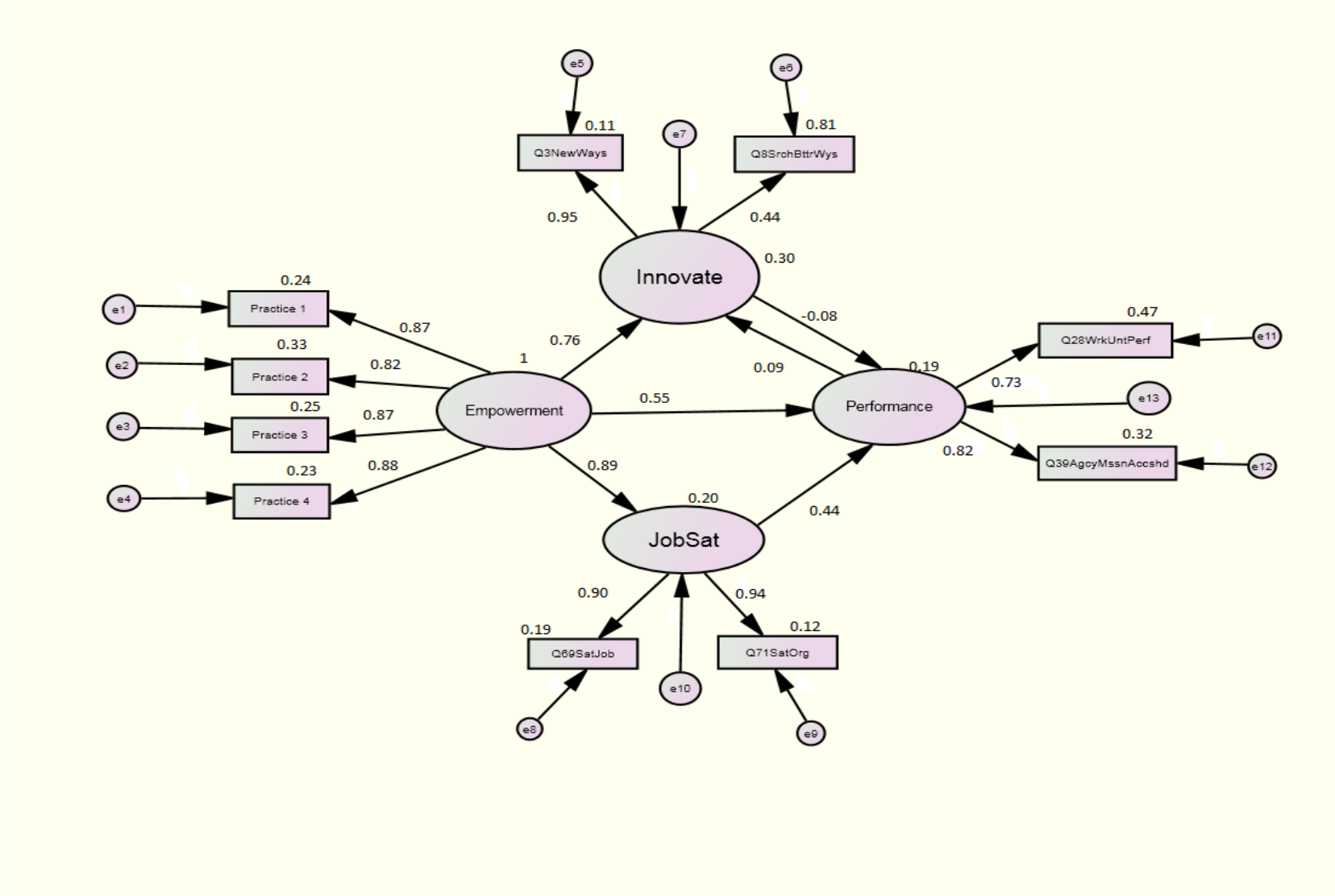

Table 1. Polychoric/Polyserial Correlation Matrix vs. Pearson Correlation Matrix, and Descriptive Statistics. $N = 197{,}446$.

Variables/Parameters		Polychoric/Polyserial Correlation Scores									
		1	2	3	4	5	6	7	8	9	10
Empowerment Practices											
1	Practice 1	1.000									
2	Practice 2	0.716	1.000								
3	Practice 3	0.763	0.718	1.000							
4	Practice 4	0.768	0.722	0.743	1.000						
Innovativeness											
5	NewWays	0.665	0.638	0.720	0.708	1.000					
6	SrchBttrWys	0.296	0.258	0.315	0.307	0.412	1.000				
Job Satisfaction											
7	SatJob	0.549	0.574	0.574	0.555	0.512	0.290	1.000			
8	SatOrg	0.635	0.589	0.617	0.623	0.563	0.347	0.601	1.000		
Performance											
9	WrkUntPerf	0.693	0.633	0.698	0.734	0.663	0.376	0.582	0.623	1.000	
10	AgcyMssnAccshd	0.746	0.680	0.700	0.752	0.660	0.333	0.576	0.699	0.845	1.000
Means		0.00	0.00	0.00	0.00	3.67	4.42	3.87	3.68	4.29	3.98
Std. Dev.		0.85	0.92	0.83	0.79	1.14	0.67	1.01	1.06	0.78	0.87
Variance		0.73	0.84	0.70	0.63	1.31	0.45	1.03	1.12	0.61	0.76
Skewness		-0.59	-0.41	-0.87	-0.54	-0.71	-1.13	-0.97	-0.79	-1.08	-1.09
Kurtosis		0.03	-0.46	0.54	-0.29	-0.33	1.96	0.60	0.08	1.30	1.67

Variables/Parameters		Pearson Correlation Scores									
		1	2	3	4	5	6	7	8	9	10
Empowerment Practices											
1	Practice 1	1.000									
2	Practice 2	0.716	1.000								
3	Practice 3	0.763	0.718	1.000							
4	Practice 4	0.768	0.722	0.743	1.000						
Innovativeness											
5	NewWays	0.641	0.615	0.701	0.688	1.000					
6	SrchBttrWys	0.260	0.227	0.283	0.272	0.310	1.000				
Job Satisfaction											
7	SatJob	0.511	0.527	0.545	0.513	0.441	0.224	1.000			
8	SatOrg	0.594	0.543	0.586	0.584	0.488	0.257	0.509	1.000		
Performance											
9	WrkUntPerf	0.658	0.603	0.676	0.703	0.595	0.289	0.497	0.537	1.000	
10	AgcyMssnAccshd	0.716	0.650	0.679	0.725	0.598	0.253	0.492	0.614	0.769	1.000

Table 2. CVM (ADF/WLS) Estimates and Disturbance Variances for a Non-Recursive Model of the Effects of Empowerment on Innovativeness, Job Satisfaction, and Performance. $N = 197{,}446$.

Parameter	Unstandardized Coefficient	S.D.	C.R.	P	Standardized Coefficient
Regression weights					
Practice 1<--Empowerment	1.064	0.002	474.150	***	0.871
Practice 2<--Empowerment	1.000				0.819
Practice 3<--Empowerment	1.058	0.002	470.087	***	0.866
Practice 4<--Empowerment	1.074	0.002	480.689	***	0.879
NewWays<--Innovate	1.000				0.946
SrchBttrWys<--Innovate	0.460	0.003	170.860	***	0.436
SatJob<--JobSat	0.958	0.001	643.278	***	0.900
SatOrg<--JobSat	1.000				0.939
WrkUntPerf<--Performance	0.886	0.003	335.591	***	0.730
AgcyMssnAccshd<--Performance	1.000				0.823
Innovate<--Empowerment	0.880	0.012	76.249	***	0.762
JobSat<--Empowerment	1.026	0.002	444.499	***	0.894
Performance<--Empowerment	0.555	0.008	66.385	***	0.552
Performance<--Innovate	-0.068	0.007	-9.743	***	-0.078
Performance<--JobSat	0.384	0.004	86.744	***	0.438
Innovate<--Performance	0.102	0.012	8.188	***	0.089
Disturbance Variances					
Empowerment	0.670	0.003	218.884	***	1.000
Practice 1	0.241	0.001	251.703	***	0.241
Practice 2	0.330	0.001	274.541	***	0.330
Practice 3	0.250	0.001	254.866	***	0.250
Practice 4	0.227	0.001	247.494	***	0.227
NewWays	0.105	0.003	30.650	***	0.105
SrchBttrWys	0.810	0.003	302.445	***	0.810
Innovativeness	0.265	0.004	75.414	***	0.296
SatJob	0.191	0.001	209.031	***	0.191
SatOrg	0.118	0.001	141.627	***	0.118
Job Satisfaction	0.177	0.001	162.299	***	0.201
WrkUntPerf	0.467	0.002	253.851	***	0.467
AgcyMssnAccshd	0.322	0.002	187.286	***	0.322
Performance	0.130	0.001	88.080	***	0.191

Table 3. CVM (ADF/WLS) Residual Covariance Matrix for a Non-Recursive Model of the Effects of Empowerment on Innovativeness, Job Satisfaction, and Performance. $N = 197{,}446$.

Variables		Unstandardized Covariance Residuals									
		1	2	3	4	5	6	7	8	9	10
Empowerment Practices											
1	Practice 1	0.000									
2	Practice 2	0.003	0.000								
3	Practice 3	0.008	0.009	0.000							
4	Practice 4	0.002	0.002	-0.019	0.000						
Innovativeness											
5	NewWays	-0.027	-0.013	0.032	0.009	0.000					
6	SrchBttrWys	-0.023	-0.042	-0.002	-0.015	0.000	0.000				
Job Satisfaction											
7	SatJob	-0.008	-0.026	0.001	0.027	0.017	0.079	0.000			
8	SatOrg	0.014	-0.008	-0.027	0.013	-0.014	0.023	0.000	0.000		
Performance											
9	WrkUntPerf	-0.010	0.049	0.019	-0.009	0.004	0.056	0.009	-0.022	0.000	
10	AgcyMssnAccshd	0.005	-0.003	-0.009	-0.013	-0.010	0.083	-0.023	0.024	0.000	0.000

Variables		Standardized Covariance Residuals									
		1	2	3	4	5	6	7	8	9	10
Empowerment Practices											
1	Practice 1	0.000									
2	Practice 2	0.940	0.000								
3	Practice 3	3.011	3.241	0.000							
4	Practice 4	0.620	0.691	-6.569	0.000						
Innovativeness											
5	NewWays	-10.009	-4.725	11.647	3.320	0.000					
6	SrchBttrWys	-9.659	-17.712	-0.794	-6.261	0.000	0.000				
Job Satisfaction											
7	SatJob	-2.851	-9.506	0.522	9.650	6.410	33.491	0.000			
8	SatOrg	5.122	-2.796	-9.798	4.800	-5.264	9.559	0.000	0.000		
Performance											
9	WrkUntPerf	-3.694	19.329	7.334	-3.389	1.728	24.343	3.487	-8.467	0.000	
10	AgcyMssnAccshd	1.841	-1.202	-3.490	-4.877	-3.740	35.793	-8.728	8.888	0.000	0.000

Table 4. CVM (ADF/WLS) Model Fit Statistics for a Non-Recursive Model of the Effects of Empowerment on Innovativeness, Job Satisfaction, and Performance.

Fit Scalar	Index Value
χ^2	33,807
df	29
p	0.0001
χ^2/df	1,165.76
BIC	33,453
RMSEA (Root Mean Square Error of Approximation)	0.077
SRMR (Standardized Root Mean Square Residuals)	0.023
GFI (Joreskog and Sorbom Goodness-of-Fit Index)	0.967
AGFI (Adjusted GFI)	0.938
CFI (Bentler Comparative Fit Index)	0.978
NFI (Bentler-Bonnettt Normed Fit Index)	0.978
TLI (Tucker-Lewis Index)	0.966

Appendix 1. Variables and Measures

Employee empowerment

Practice 1 (information about goals and performance). Measured using a summated rating scale created from the following three ordinal survey items: Managers review and evaluate the organization's progress toward meeting its goals and objectives (1 = strongly disagree through 5 = strongly agree); Supervisors/team leaders provide employees with constructive suggestions to improve their job performance (1 = strongly disagree through 5 = strongly agree); and 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)?

Practice 2 (rewards based on performance). Measured using a summated rating scale created from the following four ordinal survey items: Promotions in my work unit are based on merit (1 = strongly disagree through 5 = strongly agree); Employees are rewarded for providing high quality products and services to customers (1 = strongly disagree through 5 = strongly agree); Pay raises depend on how well employees perform their jobs (1 = strongly disagree through 5 = strongly agree); and Awards in my work unit depend on how well employees perform their jobs (1 = strongly disagree through 5 = strongly agree).

Practice 3 (access to job related knowledge and skills). Measured using a summated rating scale created from the following three ordinal survey items: I am given a real opportunity to improve my skills in my organization (1 = strongly disagree through 5 = strongly agree); The workforce has the job-relevant knowledge and skills necessary to accomplish organizational goals (1 = strongly disagree through 5 = strongly agree); and Supervisors/team leaders in my work unit support employee development (1 = strongly disagree through 5 = strongly agree).

Practice 4 (discretion to change work processes. Measured using a summated rating scale created from the following ordinal survey items: Employees have a feeling of personal empowerment with respect to work processes (1 = strongly disagree through 5 = strongly agree); and How satisfied are you with your involvement in decisions that affect your work (1 = very dissatisfied through 5 = very satisfied)?

Innovativeness

NewWays (encouragement to innovate). Measured using the following ordinal survey item: I feel encouraged to come up with new and better ways of doing things (1 = strongly disagree through 5 = strongly agree).

SrchBttrWys (innovative behavior). Measured using the following ordinal survey item: I am constantly looking for ways to do my job better (1 = strongly disagree through 5 = strongly agree).

Job satisfaction

SatJob (satisfaction with organization). Measured using the following ordinal survey items: Considering everything, how satisfied are you with your organization (1 = very dissatisfied through 5 = very satisfied)?

SatOrg (satisfaction with job). Measured using the following ordinal survey item: Considering everything, how satisfied are you with your job (1 = very dissatisfied through 5 = very satisfied)?

Performance

WrkUntPerf (work unit performance). Measured using the following ordinal survey item: How would you rate the overall quality of work done by your work unit (1 = very poor through 5 = very good)?

AgcyMssnAccshd (agency performance). Measured using the following ordinal survey item: My agency is successful at accomplishing its mission (1 = strongly disagree through 5 = strongly agree).

Notes

[i] 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-factor model, 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 statistics 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. According to Fornell and Larcker (1981), average variance explained (AVE) statistics greater than 0.50 are indicative of convergent validity. The four empowerment practices have AVEs between 0.74 and 0.96. 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 to 0.12.

[ii] Bollen (1989) states the model must meet the *t*-rule for identification. The *t*-rule, $t < \frac{1}{2}(p+q)(p+q+1)$, is the necessary but not sufficient condition for identification. As further described by Bollen (1989) and Kline (2011) a two-step rule is employed in fitting the model. In the first step, the model is treated as a confirmatory factor analysis to establish that all parameters are identified. In the second step, the latent variable structures are assessed using a polychoric/polyserial matrix by a weighted least squares (WLS) method. If both steps show model parameter identification, than the sufficient condition that the entire model is identified is met.

[iii] Alternatively, for continuous and normally distributed variables, a GLS method may be employed where: $F_{GLS} = \left(\frac{1}{2}\right)\mathrm{tr}([\mathbf{I} - \boldsymbol{\Sigma}(\boldsymbol{\theta})\mathbf{S}^{-1}]^2)$. However, it is generally said that the ML method is more efficient than the GLS approach with producing the estimates of standard errors.

[iv] These thresholds are easily set/estimated by every SEM program given the distribution and characteristics in the data. [R] estimates the thresholds and the polychoric correlations jointly from the bivariate marginal distribution. Joreskog (1994) argues this is the most often used practice.

[v] Bollen (1989) and Finney and DiStefano (2006) caution that the CVM has unbiased parameter estimates but the standard errors tend to be low. Consequently, we estimate bootstrapped standard errors that correct the standard errors upwards (sem boot program by Fox, 2009).

[vi] All SEM analyses are conducted in [R]. See Fox (2009) and Revelle (2007) for a discussion of the software and applications. Similar estimation methods with polychoric/polyserial corrected correlation scores that are fit with WLS are present in LISRELand M-plus. Model fit statistics are discussed in the Results section.

[vii] Please note that in Table 3 the standardized residual covariance matrix contains a few significant scores (ratios of covariance residuals over standard errors). Kline (2011, p. 171) argues that these results are quite normal for very large data sets. Thus, we only concentrate on the unstandardized fitted values.

[viii] For reasons of brevity, these model fit results are omitted from the paper but are available from the authors upon request.