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## How Leadership and Public Service Motivation Enhance Innovative Behavior

**Abstract:** *Prior research has linked the innovative behavior of public sector employees to desirable outcomes such as improved efficiency and higher public service quality. However, questions regarding the drivers of innovative behavior among employees have received limited attention. This article employs psychological empowerment theory to examine the underlying processes by which entrepreneurial leadership and public service motivation (PSM) shape innovative behavior among civil servants. Based on three-wave data from 281 Chinese civil servants and their 59 department heads, entrepreneurial leadership is found to positively influence subordinates' innovative behavior by enhancing two dimensions of psychological empowerment: meaning and impact. Additionally, PSM was found to influence subordinates' innovative behavior by enhancing the dimensions of meaning and competence. These findings suggest that to facilitate innovative behavior among employees, public organizations should consider introducing training that encourages leaders to serve as entrepreneurial role models and recruit employees with high levels of PSM.*

### Evidence for Practice

- Public managers can spur innovative behavior among their subordinates by acting as entrepreneurial role models.
- Entrepreneurial leadership was found to positively influence employees' innovative behavior by enhancing their feelings of meaning and impact.
- PSM was found to positively influence employees' innovative behavior by enhancing their feelings of meaning and competence.
- To facilitate innovative behavior in public sector employees, organizations should introduce training that stresses the importance of leaders who act entrepreneurially and encourage subordinates to identify and exploit entrepreneurial opportunities in the workplace.

The “innovation imperative” for public organizations arises because of both external and internal pressures (Jordan 2014). Changes in the external environment, such as increasingly scarce resources, rising citizen expectations for more responsive and accountable government, and deliberate internal choices aimed at reducing performance gaps in the pursuit of higher service levels, require innovation (Walker 2008). Despite a stream of studies on public sector innovation from the mid-1970s to 1990 (e.g., Perry and Kraemer 1979) and a recent surge in interest in this topic (e.g., Fernandez and Moldogaziev 2013b), Hartley, Sørensen, and Torfing noted that “there seems to be considerable disagreement about how to spur and sustain public innovation” (2013, 821). Given that innovation in public sector organizations has been linked to improved effectiveness, efficiency, and citizen involvement, it is important to analyze the factors that elicit innovative behavior in public

servants (Salge and Vera 2012). However, few studies have investigated the antecedents of employees' innovative behavior in public sector organizations (Bysted and Hansen 2015).

Using three waves of data from multiple informants within Chinese public sector agencies in six Chinese cities, the present article examines whether entrepreneurial leadership, defined as a leadership style that influences and directs subordinates toward the achievement of organizational goals that involve the identification and exploitation of entrepreneurial opportunities (Renko et al. 2015), is effective at promoting the engagement of subordinates in innovative behavior in the workplace. Drawing on psychological empowerment theory (Spreitzer 1995), which suggests that leaders play an important role in shaping employees' subjective perceptions of their work, we argue that by acting as role models for employees and furnishing them with support in

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their engagement in entrepreneurial activity, entrepreneurial leaders positively influence subordinates to engage in innovative behavior. We also argue that employees' public service motivation (PSM), defined as "a particular form of altruism or prosocial motivation that is animated by specific dispositions and values arising from public institutions and missions" (Perry, Hondeghem, and Wise 2010, 682), influences their innovative behavior by enhancing their psychological empowerment. Although a growing body of research has established the positive effects of PSM on employee performance and other work outcomes, few studies have examined its effects on the innovative behavior of employees and the mechanisms that may underlie those effects (Ritz, Brewer, and Neumann 2016).

Innovation is particularly relevant for the Chinese public sector. Faced with a rapidly changing environment, Chinese public organizations have amended their form, structure, and scope multiple times since the beginning of reforms in 1978 (Xue and Liou 2012). President Hu Jintao elevated the relentless pursuit of innovation to a national policy (Leung et al. 2014). While innovation in public organizations is crucial to avoid arcane processes and procedures that hamper economic progress, Wu, Ma, and Yang observed that "the overall state of innovation in the Chinese public sector remains unclear" (2013, 347).

In the present article, we aim to make several contributions to the public administration literature. First, we answer the calls of scholars to investigate the outcomes of entrepreneurial leadership and PSM using multisource data instead of self-reported data (Perry, Hondeghem, and Wise 2010; Renko et al. 2015). While prior studies of public sector innovation have typically used a qualitative approach and focused predominantly on the United States or the United Kingdom (de Vries, Bekkers, and Tummers 2016), we conduct a quantitative study using dyadic data from China. Second, by examining the mediating mechanism of psychological empowerment, we shed light on the underlying psychological processes that link both entrepreneurial leadership and PSM to employees' innovative behavior in public sector organizations. Unlike other public sector studies that analyze the mediating effects of psychological empowerment, we take a more nuanced approach by examining the relative importance of the four main subdimensions of psychological empowerment: meaning, competence, self-determination, and impact (Tummers and Knies 2013).

This article is structured as follows: First, we review the literature on the key variables and develop our hypotheses (figure 1 illustrates the research model). After a description of the research context

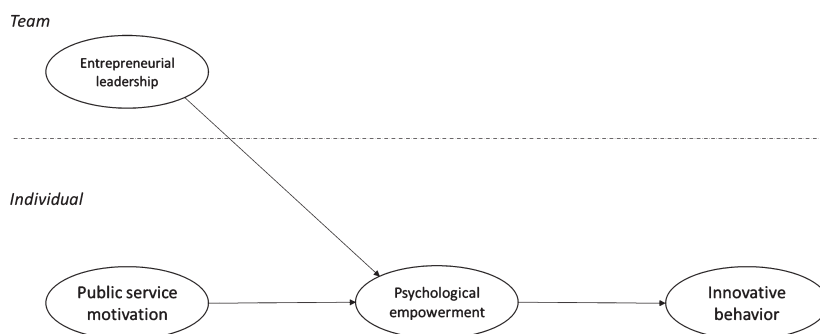
and our methodology, we conduct a confirmatory factor analysis to determine the construct validity of our measurement model and test our hypotheses using multilevel mediated regression analyses. Finally, we discuss the importance of our results in helping us better understand how public organizations can foster innovation.

### Innovative Behavior in Public Sector Organizations

In an age of austerity in which public organizations around the globe face an increasingly turbulent operating environment and the challenge to do more with less, innovation has become central to effective service delivery to citizens (Bernier, Hafsi, and Deschamps 2015). Innovation refers to "an idea, practice, or project that is perceived as new by an individual or other unit of adoption" (Rogers 2003, 12). Innovations are different from inventions in the sense that they must be implementable, and they are different from continuous improvement in that they go beyond minor changes and adaptations (Moore and Hartley 2008).

Altshuler noted that "the predominant view of innovation in government has been one of suspicion" (1997, 1). Innovation has been questioned as a legitimate function of public management because risk taking and bureaucratic discretion are contrary to traditional public administration concerns with control and accountability and may result in failure, the abuse of citizen rights, favoritism, or corruption (Terry 1993). Innovation that has not been explicitly authorized (e.g., skunkworks projects that do not follow routine procedures) is often considered to be unacceptable (Halachmi 2002). Frequently, more rules, controls, and constraints that limit the acceptable behavior of civil servants, rather than innovation, are considered to be a remedy in the case of performance deficiencies (Kelman 2008). However, public organizations must change frequently because of shifts in public policy and priorities (Ricard et al. 2017). Innovative practices can help public sector organizations address changes and stakeholder expectations and provide legitimacy for the government as an institution that creates public value (Moore 2014).

Research dispels the myth that public organizations are not innovative because of the nonexistence of a market mechanism that eliminates organizations that do not adapt to their task environment (e.g., Damanpour and Schneider 2009). Most studies have focused on innovation at the policy (Osborne and Brown 2011), organizational (Walker 2008), and project levels (Borins 2000). The innovative behavior of individual employees has received far less attention (de Vries, Bekkers, and Tummers 2016). However, because of the importance of innovation, public



**Figure 1 Hypothesized Mediation Model**

sector organizations increasingly expect their employees to play a contributing role (Altshuler 1997). For the purposes of this study, we define employees' innovative behavior as the generation and implementation of new and useful ideas by public sector employees, in line with previous research on public sector organizations (Bysted and Hansen 2015). Individual innovation can be viewed as a multistage process that starts with problem recognition and the generation of ideas either internally or through the adoption of external practices (Fernandez and Wise 2010). In the next stage, an innovative individual seeks to promote his or her ideas to others within the organization. Finally, innovative behavior includes the preparation of plans and schedules for the implementation of new ideas so that they can be used productively (Scott and Bruce 1994).

Empirical work suggests that frontline employees are important sources of innovation in public sector organizations (Bernier, Hafsi, and Deschamps 2015). Reviewing award-winning innovations in government, Borins (2000) found that innovators were usually not senior managers but street-level bureaucrats. Middle- to lower-level employees are particularly critical to the successful implementation of new ideas.

In light of the importance of employees to organizational innovation, the role played by managerial leadership and employees' PSM in driving innovative behavior in public sector employees needs to be examined in more detail.

### **Entrepreneurial Leadership and Innovative Behavior**

The extent to which public managers should be entrepreneurial has been debated throughout public administration history. Max Weber, the founder of the modern study of bureaucracy, noted that the authority to give commands should be "strictly delimited by rules" (Weber 1970 [1922], 196). In contrast, Woodrow Wilson, one of the founding fathers of the modern study of public administration, envisioned more room for managerial discretion as "a certain degree of administrative autonomy was required to make policy delivery effective" (Wilson 1887, 200). The New Public Management (NPM) and reinventing government reform movements encouraged a more entrepreneurial approach to managing public sector organizations (Borins 2000). Hennessey (1998) showed that leaders make a significant difference in reinventing government by fostering support and nurturing cultures that facilitate innovation. Roberts and King even stated that "public entrepreneurship is the process of introducing innovation" (1991, 147).

Verhoest, Verschuere, and Bouckaert (2007) suggested that NPM-type reforms both "let public managers innovate" and "make public managers innovate." Allowing managers to innovate removes bureaucratic obstacles and provides them with the decision-making competencies and autonomy that are necessary to deviate from established practices (Damanpour and Schneider 2009). Making them innovate creates incentives to engage in risky innovative behavior that, at least in some cases, may fail to produce the desired results. In their analysis of innovation in the Chinese public sector, Wu, Ma, and Yang (2013) concluded that fiscal decentralization and cadre personnel management, with its inherent potential reward of career advancement, were the core means by which the central government incentivizes local government officials to innovate. Innovative employees are also rewarded through innovation awards

programs. The Innovations and Excellence in Chinese Local Governance awards program, for example, in addition to the honor of being nominated, bestows 50,000 renminbi on winners and 10,000 renminbi on finalists (Wu, Ma, and Yang 2013).

Although some public sector studies have recognized the importance of leadership as an organizational antecedent to innovation (de Vries, Bekkers, and Tummers 2016), other studies have cast doubt on the relationship between leadership and innovation adoption (e.g., Perry and Kraemer 1980). Scholars have only very recently developed a measure of entrepreneurial leadership that assesses the extent to which leaders influence and direct their subordinates in identifying and exploiting entrepreneurial opportunities and confirmed its discriminant validity from other leadership styles, such as transformational leadership (Renko et al. 2015). Entrepreneurial leaders not only encourage their subordinates to experiment and innovate in the workplace, but also they act as role models for their subordinates by engaging in entrepreneurial activities themselves and encouraging subordinates to emulate that behavior (Meijer 2014). They generate ideas and creative solutions to problems, challenge the status quo, create a climate of innovation by encouraging risk taking, and tolerate failed ideas. Entrepreneurial leaders also provide critical resources for innovation, such as time, equipment, and facilities (Scott and Bruce 1994).

Fernandez and Rainey (2006) emphasized that management practices are important for employee acceptance of change. Despite some evidence that entrepreneurial leadership may be effective in promoting innovative outcomes in the public sector (Ricard et al. 2017), there is limited knowledge of the underlying psychological processes that link entrepreneurial leadership with the innovative behavior of individual employees.

### **Public Service Motivation and Innovative Behavior**

In their seminal article analyzing the motivational bases for public service, Perry and Wise wrote that "committed employees are likely to engage in spontaneous, innovative behaviors on behalf of the organization" (1990, 371). While the positive relationship between PSM and commitment has been established (Crewson 1997), the influence of employees' PSM on their innovative behavior has received surprisingly limited attention in the literature despite the fact that research has found a link between employees' PSM and other measures of performance (Ritz, Brewer, and Neumann 2016). Researchers have only very recently begun to examine the general relationship between PSM and innovation, for example, by analyzing the extent to which managers' PSM facilitates innovative behavior among their employees (Hatmaker, Hassan, and Wright 2014) or causes them to adopt innovative ideas themselves (Hsu and Sun 2014). Wright, Christensen, and Isett (2013b) found that employees who scored high on the self-sacrifice dimension of PSM were more likely to support organizational change, and they suggested that this may be because such employees are less likely to be concerned with change that adversely affects them personally. However, the impact of employees' PSM on their innovative behavior has not yet been examined in detail.

In the following sections, we highlight the importance of psychological empowerment as a mechanism that links both

entrepreneurial leadership and PSM to employees' innovative behavior and develop hypotheses accordingly.

## Psychological Empowerment

Two different perspectives of empowerment have emerged in the literature (Hassan, Wright, and Park 2016). The first is a managerial perspective that considers empowerment to be the delegation of decision making from higher to lower organizational levels (Fernandez and Moldogaziev 2013b). Under this perspective, empowerment is viewed as a relational construct, as authority, information, and rewards are shared between supervisors and subordinates, which has been the case in many NPM-type reforms (Fernandez and Moldogaziev 2013a). However, simply sharing power with subordinates is not enough to realize the full benefits of empowerment, as some employees may view new responsibilities as an unwelcome burden (Renko et al. 2015).

The second perspective views empowerment from the point of view of the employee and treats it as a psychological construct (Spreitzer 1995). Psychological empowerment focuses on the conditions that allow employees to believe that they have control over their work, which encourages them to become willing to take on more responsibility (Cho and Faerman 2010). Psychological empowerment is the perspective that is adopted in this article.

Spreitzer (1995) defined psychological empowerment as a form of intrinsic motivation to perform tasks that comprise four cognitive variables: meaning, competence, self-determination, and impact. Psychological empowerment is highest when all four dimensions are high (Maynard, Gilson, and Mathieu 2012). The first variable, *meaning*, refers to the match between a job's requirements and an individual's values and beliefs (Tummers and Knies 2013). The second variable, *competence*, is defined as an individual's feeling of confidence that he or she has the ability to complete the tasks required of him or her (Cho and Faerman 2010). This can be directly linked to Bandura's (1997) notion of self-efficacy. The third variable, *self-determination*, refers to whether an individual feels that he or she has the ability to make decisions about how to perform work (Knol and van Linge 2009). The final variable, *impact*, refers to the extent to which individuals believe that their work has an influence on their immediate work environment and that of the organization (Knol and van Linge 2009). Impact is different from self-determination. While self-determination refers to an employee's sense of control over his or her own work, impact refers to an employee's sense of control over organizational outcomes. In their recent review of two decades of psychological empowerment research, Maynard, Gilson, and Mathieu stated that "the consistency of the four-dimensional factor structure is impressive given that both convergent validity and discriminant validity have been found in international samples; across different types of organizations and work contexts, including samples of nurses; and with both blue-collar and white-collar employees" (2012, 1236).

## Entrepreneurial Leadership and Psychological Empowerment

In this section, we highlight how entrepreneurial leadership fosters higher levels of psychological empowerment and propose that psychological empowerment mediates the relationship between entrepreneurial leadership and employees' innovative behavior. Compared with more transactional styles of leadership (Van Wart

2013), entrepreneurial leadership focuses more on empowerment than control strategies, encouraging subordinates to be independent and proactive in seeking and exploiting new opportunities at work (Renko et al. 2015). Therefore, entrepreneurial leadership might be expected to enhance the various facets of psychological empowerment in a number of ways.

By involving subordinates in innovative activity that is crucial to the success of their department or organization and stressing the importance of such activity, entrepreneurial leaders send a clear message to subordinates that their work is valued. Doing so is likely to enhance subordinates' perceptions of *meaning*. For example, in their study of Dutch public employees from two large municipalities, a university and the health care sector, Tummers and Knies (2013) found that leaders play an important role in making the work of public employees more meaningful. Second, by providing advice and support to subordinates and acting as entrepreneurial role models that may be emulated by subordinates, entrepreneurial leaders increase subordinates' confidence that they are able to do what is required of them. For example, in a study of 365 senior public managers from three large European cities, Ricard et al. (2017) found that entrepreneurial leaders provide employees with learning opportunities. This should enhance their perceptions of *competence*.

Through removing obstacles that hold back their employees, delegating responsibility, and encouraging employees to take the initiative to identify and exploit new opportunities (Damanpour and Schneider 2009), entrepreneurial leaders enhance subordinates' perceptions of *self-determination*. For example, in a study of street-level bureaucrats from a U.S. state agency, all of the respondents demanded that their managers provide them with sufficient autonomy (Petter et al. 2002). Finally, by challenging subordinates to act in a more innovative way and linking their engagement in opportunity identification and exploitation activities to the future success of the department or organization in which they work, entrepreneurial leaders enhance subordinates' perceptions that their work has *impact* (Renko et al. 2015).

By enhancing employees' psychological empowerment, entrepreneurial leadership is also likely to enhance employees' innovative behavior. There is growing recognition among researchers that psychological empowerment explains the process by which contextual antecedents at work, such as leadership, exert their influence on employees' work outcomes by shaping employees' subjective perceptions of their work (Spreitzer 1995). For example, in a meta-analysis, Seibert, Wang, and Courtright (2011) urged researchers to examine psychological empowerment as a mediator to explain the effects of contextual antecedents, such as leadership, on behavioral consequences, such as innovative behaviors. Similarly, Taylor (2013) emphasized that psychological empowerment can serve as an important mediator that explains how external contingencies relate to behavioral outcomes in public sector research.

Although the effects of psychological empowerment on the relationship between entrepreneurial leadership and innovative behavior have not yet been examined, prior research suggests that psychological empowerment may explain the process by which

leadership shapes employees' work outcomes in the public sector. For example, based on a sample of 520 nurses employed in a public sector hospital in Singapore, Avolio et al. (2004) found that psychological empowerment mediated the relationship between leadership style and organizational commitment. Similarly, using public sector survey data from samples in local government, health care, and education, Tummers and Knies (2013) established that components of psychological empowerment can serve as mediators between leadership and work outcomes. In light of these findings and growing work linking various facets of psychological empowerment to the innovative work behaviors of public sector employees (Bysted and Hansen 2015; Fernandez and Moldogaziev 2013b; Knol and van Linge 2009), it is proposed that entrepreneurial leadership will enhance the innovative behavior of employees through psychological empowerment.

**Hypothesis 1:** Entrepreneurial leadership is positively related to psychological empowerment.

**Hypothesis 2:** Psychological empowerment mediates the relationship between entrepreneurial leadership and innovative behavior.

### **Public Service Motivation and Psychological Empowerment**

Although prior research has not closely examined the effects of PSM on employees' psychological empowerment, we predict that PSM will enhance the various facets of psychological empowerment in a number of ways. First, given that many people join public organizations precisely because they intend to do meaningful work and contribute to their communities (Perry, Hondeghem, and Wise 2010), we expect PSM to be positively related to the dimension of *meaning*. Second, civil servants with higher levels of PSM might be expected to ensure that they have the *competence* that is required to benefit others. In their study on the effects of organizations on PSM, Moynihan and Pandey (2007) found that PSM was significantly and positively related to civil servants' level of education and membership in professional organizations, both of which contribute to competence acquisition. PSM is also likely to be positively related to *self-determination*, as Moynihan and Pandey (2007) also showed that red tape—the rules and regulations that limit self-discretion but do not advance the legitimate purposes for which they were created—was negatively related to PSM.

As PSM leads individuals to seek out opportunities to work on projects that have a significant impact on their community (Van Loon et al. 2016), individuals with higher levels of PSM are more likely to feel that their work has *impact* than those with lower levels of PSM. In a quasi-experiment with fundraisers serving a public university, Grant (2008) showed that employees' motivation could be increased by connecting them to the prosocial impact of their work. Moreover, Stritch and Christensen (2014) found that PSM strongly predicted employees' perceptions of the social impact of their jobs.

By enhancing their psychological empowerment, PSM is also likely to enhance employees' innovative behavior. Drawing on data from the U.S. Merit Principles Survey, Moon and Christensen (2014) found that the impact of PSM on perceived performance was enhanced for civil servants with strong feelings of psychological

empowerment. As this work suggests that psychological empowerment may interact with PSM to influence work quality, we argue that PSM is likely to foster employees' innovative behavior by enhancing different facets of psychological empowerment. We propose that PSM enhances the innovative behavior of employees by making them feel that their work is more purposeful (meaning), that they are competent in doing their work (competence), that they have control over their work (self-determination), and that their work has an influence on their immediate work environment (impact). This leads us to the following hypotheses:

**Hypothesis 3:** PSM is positively related to psychological empowerment.

**Hypothesis 4:** Psychological empowerment mediates the relationship between PSM and innovative behavior.

## **Methods**

### **Sample and Procedures**

A total of 156 bureau directors from the Yangtze Delta Zone (Shanghai and the adjacent provinces of Jiangsu and Zhejiang) who were participating in a leadership development program were invited to join a research project titled "Leadership and Subordinates' Innovation." Of those, 135 indicated their willingness to participate and provided their contact information to the research team.

At the beginning of the project, we randomly selected 14 public sector bureau directors from the contact list that was compiled during the leadership training course. We approached them and explained our research purpose and requirements. Each director provided us with a list of department heads under their leadership. We gathered survey data from the department heads (supervisors) and their immediate subordinates. Gathering data from two sources allowed us to reduce the common method biases often associated with single-source data (Podsakoff, MacKenzie, and Podsakoff 2012).

Data were collected in three waves. Prior to our data collection, bilingual members of the research team translated the questionnaires from Chinese to English using a back-translation procedure. At time 1, questionnaires were distributed to the employees (subordinates) who worked directly under the head of each department. The employees were required to provide their own demographics and rate the entrepreneurial leadership behavior of the department head. At time 2, two weeks later, the employees who had responded to the first wave of the survey were required to rate their psychological empowerment. Finally, at time 3, four weeks later, the department heads were asked to rate the innovative behavior of their subordinates. All participants were assured that their responses were anonymous and informed of the voluntary nature of their participation. All sets of questionnaires were distributed in a printed format and coded to ensure that the responses of the subordinates and their supervisors could be matched. Both the subordinates and the department heads were asked to return the completed surveys directly to members of the research team.

In total, we obtained responses from 281 subordinate working under 59 department heads (representing an overall response rate of 82 percent), with an average of just under 5 subordinates per

**Table 1** Participants

City (Province/Area)	Bureaus	Departments	Civil Servants
Hangzhou (Zhejiang)	2	9	44
Ningbo (Zhejiang)	3	11	56
Nanjing (Jiangsu)	2	8	34
Changzhou (Jiangsu)	3	12	59
Putuo (Shanghai)	2	9	41
Putong (Shanghai)	2	10	47
Total	14	59	281

department head (see table 1). Of the 281 subordinates, 46 percent were male, had worked for their organization for 4.80 years on average ( $SD = 2.58$ ), and had worked under their present supervisor for an average of just over three years ( $M = 3.25$ ,  $SD = 1.87$ ).

### Measures

For all measures, the participants rated items using a five-point Likert scale where 1 = “strongly disagree” and 5 = “strongly agree.”

**Entrepreneurial leadership.** The subordinates rated the entrepreneurial leadership behavior of their department head using the eight-item scale developed by Renko et al. (2015). Sample items include “My supervisor has creative solutions to problems” and “My supervisor challenges and pushes me to act in a more innovative way.” The Cronbach’s alpha for this scale was .92.

**Psychological empowerment.** The subordinates rated their psychological empowerment using the 12-item scale developed by Spreitzer (1995), which has been applied in previous public sector research (Cho and Faerman 2010; Taylor 2013). Sample items include “The work I do is very important to me” (meaning), “I am confident about my ability to do my job” (competence), “I have significant autonomy in determining how I do my job” (self-determination), and “My impact on what happens in my department is large” (impact). The Cronbach’s alpha for each of the subscales was .90 (meaning), .75 (competence), .79 (self-determination), and .92 (impact).

**Public service motivation.** PSM was measured by the five-item Merit Systems Protection Board scale, which was taken from the original 40 items developed by Perry (1996) and has been extensively used in previous research (Wright, Christensen, and Pandey 2013a). The items include “Meaningful public service is very important to me” and “I am prepared to make enormous sacrifices for the good of society.” The Cronbach’s alpha for this scale was .78.

**Innovative behavior.** The department heads rated the innovative behavior of subordinates using five items from a scale developed by Scott and Bruce (1994) that has been applied in recent public sector studies (e.g., Bysted and Hansen 2015; Im, Campbell, and Jeong 2016). Sample items include “This employee generates creative ideas” and “This employee searches out new technologies, processes, techniques, and/or ideas.” One item from the original scale was not included because employees in the government agencies were not required to seek funding. The Cronbach’s alpha for the scale was .94.

**Control variables.** Tenure and time spent under their supervisor (both measured in years) and follower’s gender (coded 1 = male,

**Table 2** Results of Confirmatory Factor Analysis

Model	X <sup>2</sup>	df	IFI	CFI	RMSEA	SRMR
Hypothesized seven-factor model: Dimensions of psychological empowerment treated as separate factors	726.67	384	.94	.94	.06	.05
Four-factor model: Dimensions of psychological empowerment treated as higher-order factor	527.28	203	.91	.91	.08	.06
Four-factor model: Items measuring psychological empowerment loaded onto one factor	1724.74	399	.76	.75	.11	.12
One-factor model	3633.26	405	.41	.40	.17	.14

Note: IFI is the incremental fit index; CFI, the comparative fit index; RMSEA, the root mean square error of approximation; and SRMR, the standardized root mean square residual.

0 = female) were included as controls in line with previous research (e.g., Miao et al. 2014).

### Method of Analysis

The present data set was multilevel in nature, consisting of 281 employees nested within 59 departments. We analyzed the data on the basis of hierarchical linear modeling because employees within the same department may be more similar to one another than to employees working in a different government department (e.g., Vashdi, Vigoda-Gadot, and Shlomi 2013). We used hierarchical linear modeling that utilized robust maximum likelihood estimation in Mplus 7.4 to test the hypotheses. To facilitate the interpretation of effect size, all of the variables were  $z$ -standardized prior to analysis. There were no violations of the regression assumptions of normality and linearity (Tabachnick and Fidell 2013) as assessed through bivariate scatterplots, residual plots, and the examination of univariate skewness and kurtosis indices. There were also no correlations that exceeded .70 among the predictors (verified by examining variance inflation factor statistics), which suggests that there is little evidence of multicollinearity.

## Results

### Construct Validity

Before hypothesis testing was undertaken, a confirmatory factor analysis was conducted to examine the construct validity of the variables used in the study and to establish whether the four dimensions of psychological empowerment (i.e., meaning, competence, self-determination, and impact) were better treated as separate factors or whether they should be combined to form a higher order factor. The hypothesized seven-factor model (i.e., items measuring entrepreneurial leadership, PSM, meaning, competence, self-determination, impact, and innovative behavior) yielded a better fit to the data than alternative models (see table 2).

Following Renko et al. (2015), we conceptualized entrepreneurial leadership as a team-level construct. The mean rwg for the entrepreneurial leadership scale was .85, indicating a high level of within-group agreement. Taken together, these results provide support for the aggregation of entrepreneurial leadership to the team level.

### Descriptive Statistics and Correlations

Table 3 presents the means, standard deviations, and correlations of the study variables. As shown in the table, there are positive correlations

**Table 3** Means, Standard Deviations, and Correlations among the Study Variables

Variable	M	SD	1	2	3	4	5	6	7	8	9
1 Entrepreneurial leadership (department level)	3.15	1.00									
2 Meaning	3.15	1.02	.49**								
3 Competence	4.25	0.60	.14*	.28**							
4 Self-determination	3.58	0.97	.26**	.28**	.28**						
5 Impact	3.21	1.16	.27**	.32**	.33**	.35**					
6 PSM	3.94	0.64	.25**	.32**	.35**	.11	.18**				
7 Innovative behavior	3.34	0.83	.32**	.50**	.34**	.28**	.38**	.28**			
8 Organizational tenure	4.80	2.58	-.10	-.13*	.11	.06	.06	-.06	.01		
9 Time under supervisor	3.25	1.87	-.09	.01	.10	.03	.11	.02	-.08	.47**	
10 Gender	0.46	0.50	.05	.01	.08	.04	.17**	.07	.05	.02	.08

Note: Gender is coded as 0=female and 1=male.

\* $p < .05$ ; \*\* $p < .01$ .

**Table 4** Results of HLM Mediated Regression Analyses

	Model 1 Meaning	Model 2 Competence	Model 3 Self-Determination	Model 4 Impact	Model 5 Innovative Behavior
	Est. SE	Est. SE	Est. SE	Est. SE	Est. SE
<b>Level 1 (n=281 employees)</b>					
Organizational tenure	-.13* (.06)	.12 (.06)	.09 (.06)	.05 (.06)	.12 (.08)
Time under supervisor	.06 (.07)	.03 (.06)	-.03 (.07)	.06 (.06)	-.18* (.05)
Gender	-.02 (.06)	.06 (.06)	.04 (.07)	.16** (.05)	.01 (.05)
PSM	.26** (.06)	.33** (.06)	.09 (.07)	.09 (.07)	.08 (.07)
Meaning					.37** (.07)
Competence					.13* (.05)
Self-determination					.06 (.06)
Impact					.19* (.07)
<b>Level 2 (n=59 departments)</b>					
Entrepreneurial leadership	.21** (.05)	.09 (.05)	.08 (.07)	.27** (.05)	.03 (.04)
<b>Random variance</b>	.01 (.04)	.01 (.07)	.09 (.05)	.05 (.04)	.01 (.04)
<b>-2 log-likelihood</b>	-372.82	-374.25	-391.86	-375.48	-333.58
<b>Total R<sup>2</sup></b>	.16** (.04)	.15** (.04)	.03 (.02)	.14** (.04)	.31** (.04)

Note: Standardized regression coefficients reported with robust standard errors in parentheses.

\* $p < .05$ ; \*\* $p < .01$ .

between entrepreneurial leadership, PSM, and innovative behavior. There were also positive correlations between each of the four dimensions of psychological empowerment and innovative behavior.

### Test of Research Hypotheses

Hypothesis 1 predicted that entrepreneurial leadership is positively related to psychological empowerment. As is shown in table 4 (models 1–4), entrepreneurial leadership was positively related to meaning ( $\beta = .21, p < .01$ ) and impact ( $\beta = .27, p < .01$ ). No statistically significant relationship was found between entrepreneurial leadership and competence ( $\beta = .09, p > .05$ ) or entrepreneurial leadership and self-determination ( $\beta = .08, p > .05$ ). Hence, hypothesis 1 was supported for the psychological empowerment dimensions of meaning and impact.

Hypothesis 2 predicted that psychological empowerment mediates the relationship between entrepreneurial leadership and innovative behavior. We followed the procedures for testing cross-level mediation as outlined in Pituch and Stapleton (2012). To test the hypothesized indirect effect, we employed a Monte Carlo simulation with the recommended 20,000 random repetitions (Preacher and Selig 2012). A Monte Carlo simulation is a flexible method for building the confidence intervals around the estimated indirect effects. It can be used when bootstrapping is not feasible, such as for complex multilevel data. The Monte Carlo technique has been found to perform favorably with bootstrapping in terms

of statistical power and accuracy (Preacher and Selig 2012). The Monte Carlo confidence intervals (CIs) for the standardized indirect effects were as follows: meaning = .08 (95 percent CI = .03 to .13), competence = .01 (95 percent CI = -.01 to .03), self-determination = .01 (95 percent CI = -.01 to .02), and impact = .05 (95 percent CI = .01 to .10). Hypothesis 2 was thus supported for the dimensions of meaning and impact, as zero is not contained in the corresponding 95 percent confidence intervals.

Hypothesis 3 predicted that PSM is positively related to psychological empowerment. As can be seen in table 4 (models 1–4), PSM was positively related to meaning ( $\beta = .26, p < .01$ ) and competence ( $\beta = .33, p < .01$ ). There were no statistically significant associations between PSM and self-determination ( $\beta = .09, p > .05$ ) or impact ( $\beta = .09, p > .05$ ). Hence, hypothesis 3 was supported for the dimensions of meaning and competence.

Hypothesis 4 predicted that psychological empowerment mediates the relationship between PSM and innovative behavior. The Monte Carlo confidence intervals for the standardized indirect effects were as follows: meaning = .10 (95 percent CI = .04 to .16), competence = .04 (95 percent CI = .01 to .08), self-determination = .01 (95 percent CI = -.01 to .02), and impact = .02 (95 percent CI = -.01 to .06). Hypothesis 4 was thus supported for the dimensions of meaning and competence, as zero is not contained in the corresponding 95 percent confidence intervals.

Overall, 31 percent of the variance in innovative behavior was explained by our model, representing a large effect size by conventional standards (Cohen 1992). When controlling for the mediating variables, the direct effect of entrepreneurial leadership on innovative behavior was not statistically significant ( $\beta = .03, p > .05$ ), supporting an inference of full mediation. Similarly, the direct effect of PSM on innovative behavior was not statistically significant ( $\beta = .08, p > .05$ ), which supports an inference of full mediation.

## Discussion

The present study found that entrepreneurial leadership, a style of leadership in which the leader acts as an entrepreneurial role model and encourages subordinates to identify and exploit entrepreneurial opportunities in the workplace, and employees' PSM are effective at promoting employees' innovative behavior by enhancing their psychological empowerment. More specifically, our findings suggest that whereas entrepreneurial leadership elicits innovative behavior by enhancing employees' perceptions of impact and meaning, PSM elicits innovative behavior through enhancing meaning and competence.

Our findings have both important theoretical and practical implications. First, the main theoretical contribution of this research results from our identification of the psychological mechanisms that link entrepreneurial leadership and PSM to subordinates' innovative behavior. Although previous research has examined the impact of other leadership styles on psychological empowerment (Seibert, Wang, and Courtright 2011), this study is the first to examine the mediating effects of psychological empowerment on the relationship between entrepreneurial leadership and employees' innovative behavior. It is also the first to analyze the mechanisms linking PSM to employees' innovative behavior. In addition, by examining the relative importance of different facets of psychological empowerment, the present study provides a more nuanced understanding than previous work on the psychological processes by which leadership and the motivations of employees shape employees' innovative behavior.

Our finding that both entrepreneurial leadership and PSM primarily drive subordinates' innovative behavior by heightening their perceptions of meaning is especially relevant. Work is considered to be meaningful when there is a fit between work requirements and an employee's own ideals, values, or standards (Spreitzer 1995). From Perry's (1996) four classic subscales—attraction to public policy making, commitment to civic duty and the public interest, compassion, and self-sacrifice—self-sacrifice refers to the roots of PSM in prosocial motivation, which emphasizes meaning and purposes as drivers of effort. Brewer and Selden highlighted the importance of meaning in their definition of PSM as “the motivational force that induces individuals to perform meaningful . . . public, community, and social service” (1998, 417).

It should also be noted that self-determination does not play a significant role in eliciting innovative behavior. Self-determination refers to an employee's ability to make choices in initiating and regulating action. Although public sector employees may feel that they may have a certain degree of autonomy in deciding work activities, this may not translate into innovative behavior because

of rules and regulations that mandate that minutely specified processes and procedures must be followed when implementing changes. This may be a case of red tape, which goes beyond mere formalization and can be defined in terms of the negative effects of rules and procedures (Moynihan and Pandey 2007). While Moon and Bretschneider (2002) found that entrepreneurial leadership, conceptualized as the risk-taking propensity of top managers, was positively associated with information technology innovativeness, their study also showed that the perception of red tape impeded innovativeness in organizations.

Our research also has important practical implications. As individuals with high levels of PSM and entrepreneurial leaders were found to elicit employees' innovative behavior, hiring practices could assess job candidates' PSM and propensity to engage in entrepreneurial leadership activities. In China, questions about PSM and entrepreneurial leadership could be integrated into the annual civil service examinations, which were taken by 1.4 million entry-level applicants in 2015 (Schwarz et al. 2016). Our results show that public organizations would be well advised to design jobs that civil servants consider meaningful and at which they feel competent. Moreover, exhibiting entrepreneurial leadership characteristics and the ability to spur innovation could be considered to be prerequisites for promotion within the civil service (Fernandez and Wise 2010). Traditionally, many public managers are promoted because of their professional ability and seniority. They often do not realize that one of their responsibilities is to encourage their employees to be more innovative (Liu and Dong 2012). Entrepreneurial leaders have to create a climate that is conducive to the development and realization of novel ideas (Meijer 2014). To overcome internal, external, and political obstacles (Borins 2000) and to drive (and protect) innovation, leaders have to act as “supporters,” “idea champions,” and “advocates” (Fernandez and Rainey 2006; Osborne and Brown 2011). To prepare them for these roles, entrepreneurial leadership training could be provided to all civil servants above a certain level. In China, the Outline of National Median and Long Range Plan for Human Resource Development that was published in 2010 includes a provision for the improvement of middle- and senior-level government officials' leadership skills (Miao et al. 2014). For example, all civil servants above the level of division chief are required to attend a three-month training session within each five-year period (Xue and Liou 2012). This setting could be used to educate managers on the importance of acting as entrepreneurial leaders.

## Conclusion

The present study employed psychological empowerment theory to examine the underlying processes that link entrepreneurial leadership and PSM to innovative behavior. Using multisource three-wave data from 281 employees reporting directly to their department heads in 59 government agencies in six Chinese cities, entrepreneurial leadership was found to positively influence employees' innovative behavior by enhancing the meaning and impact dimensions of psychological empowerment. PSM was found to positively influence employees' innovative behavior via meaning and competence. While innovative behavior is not, in itself, an end, it is a prerequisite for overall innovation in public organizations and an important facet of public value creation (Moore 2014).



This study is not without limitations. Its main limitation results from our reliance on supervisor-provided ratings of innovative behavior rather than more objective measures. In the future, we recommend that researchers use objective data on innovative behavior in addition to supervisor-provided ratings to better establish the effects of entrepreneurial leadership. Moreover, the survey design does not permit the inference of cause-and-effect relationships. Another limitation concerns the fact that data collection was carried out in one area in a single country, the Yangtze Delta Zone in China. Future research should examine whether the study's findings are generalizable to other parts of China (Wu, Ma, and Yang 2013) and across countries.

While identifying psychological empowerment as mediator of the relationship between PSM and innovative behavior is an important first step, we encourage future studies to analyze this relationship in more detail, for example, by examining multiple PSM dimensions and conducting experiments. Future research should also examine the boundary conditions of the mediated relationship between entrepreneurial leadership and innovative behavior through the various dimensions of psychological empowerment. While our focus in this article was on individual-level innovation, future research should also examine the influence of organizational-level determinants of innovation, such as organizational size, structure, and complexity, as well as the availability of slack resources. Other factors that could accentuate the relationship between entrepreneurial leadership and innovative behavior may include the extent to which an organization's reward systems incentivize innovative behavior and the innovation climate within teams.

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