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# Locus of control, psychological empowerment and intrinsic motivation relation to performance

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## Abstract

**Purpose** – The purpose of this paper is to test the relationship between psychological empowerment and R&D employees' performance. The moderating effect of locus of control and the mediating effect of intrinsic work motivation are also examined.

**Design/methodology/approach** – The questionnaires were completed by 209 R&D employees and their immediate supervisors of a large foreign-funded R&D institute in China. Hierarchical regression and bias-corrected bootstrap procedures were used to test the hypotheses.

**Findings** – Results demonstrate that psychological empowerment is positively related to R&D employees' task, contextual and innovation performance. The relationship between psychological empowerment and contextual and innovation performance was found to have been moderated by locus of control. Intrinsic work motivation partially mediates the psychological empowerment-work performance relationship.

**Research limitations/implications** – This is a cross-sectional study, with data limited to a large R&D institute in Shanghai. It did not consider organizational level variables, such as organizational structure and job characteristics.

**Practical implications** – This study highlights the importance of enhancing psychological empowerment and intrinsic work motivation to promote employees' work performance. Moreover, the results provide evidence in favor of managerial interventions aimed at motivating employees who differ on locus of control.

**Originality/value** – This study extends the psychological empowerment literature by first examining the psychological mechanism through which empowerment affects work performance and how this effect is contingent upon individual locus of control. It also provides insight into motivating R&D employees in Chinese context.

**Keywords** Performance, Psychological empowerment, Intrinsic work motivation, Locus of control

**Paper type** Research paper



## Introduction

Empowerment has long been assumed to play a crucial role in group development and organizational effectiveness by both management researchers and practitioners (Bennis and Nanus, 1985; Neilsen, 1986). Extant research has found that psychological empowerment has significant effects on employees' work-related outcomes, such as organizational commitment and job satisfaction (e.g. Aryee and Chen, 2006; Spreitzer *et al.*, 1997), task performance (e.g. Hempel *et al.*, 2012; Wagner, 1994), contextual performance or OCB (e.g. Chiang and Hsieh, 2012; Wat and Shaffer, 2005) and innovation performance (e.g. Singh and Sarkar, 2012; Sun *et al.*, 2012). However, there are many unanswered questions regarding how individual differences impact the psychological empowerment-work performance relation and the psychological mechanisms linking psychological empowerment to employees' performances.

Scholars have long been interested in the extent to which the positive effects of empowerment can be generalized across situations, such as types of industries (e.g. Batt, 2002), occupations (e.g. Kraimer *et al.*, 1999) and cultures (e.g. Seibert *et al.*, 2004). However, few theories concerning the moderating effects of personal propensities have been developed (Seibert *et al.*, 2011). Since matching individual needs and abilities with work expectations leads to improved performance, the effects of psychological empowerment on performance depend on employees' self-control abilities. Locus of control, an important individual difference, represents the generalized expectancy concerning the determinants of one's life (Rotter, 1966; Thomas and Velthouse, 1990). Internal individuals may prefer, and perform better under conditions of self-control than externals (Gregory, 1978; Rotter, 1966). Hence, the impact of psychological empowerment on performance might be contingent upon employees' locus of control.

Second, although intrinsic work motivation, i.e. the extent to which an individual is interested in a task and engages in it for the sake of the work itself (Ambrose and Kulik, 1999), has been used to explain the cognitive process of psychological empowerment with employee performance and creativity (Amabile, 1996; Thomas and Velthouse, 1990), there has been little empirical evidence to support this mechanism (Zhang and Bartol, 2010). Therefore, in their meta-analysis, Seibert *et al.* (2011) suggested that psychological empowerment theory should be integrated with theories of motivation.

Third, R&D employees play a significant role in organizational innovation and development. Given uncertain and creative tasks and their high-level skills and education, R&D employees have inherent intrinsic motivation and need for psychological empowerment (Caza, 2011; Gumusluoglu and Ilsev, 2009), but targeted research on psychological empowerment among R&D employees has been limited. Furthermore, given the long history in China of the acceptance of centralization and a large power distance (Farh *et al.*, 2007; Hofstede, 1980; Wei and Si, 2013), empowerment is not widely recognized by both of management and employees (Huang *et al.*, 2006). Hence, the results obtained in western cultures may not apply to Chinese R&D employees.

This study attempts to extend existing research in the following ways. First, we examined the moderating effect of locus of control on the relationship between psychological empowerment and work performance. Second, we tested the mechanism of psychological empowerment effectiveness by investigating the mediating effects of intrinsic work motivation. Third, this study is based on the data obtained from R&D employees in Chinese context, which would add to the understanding of psychological empowerment effectiveness.

## Theory and hypothesis development

### *Construct definition of psychological empowerment*

Managers' empowerment practices, such as supervisors' delegating decision-making power to their subordinates and providing them with enhanced access to information and resources, is called as "objective behaviors" for managing empowerment (Lee and Koh, 2001). However, these behaviors are not always effective and the definition of empowerment remains unclear and confusing (Conger and Kanungo, 1988; Thomas and Velthouse, 1990).

Conger and Kanungo (1988) clarified this concept in terms of processes of motivating workers. They turned their attention to empowered employees, examining their "subjective psychological states" after having experienced the empowering behaviors of their supervisors, which is suggested to be psychological empowerment (Lee and Koh, 2001). Thomas and Velthouse (1990) further developed this approach by defining psychological empowerment as increased intrinsic task motivation and proposing a cognitive model of empowerment, which includes four dimensions – meaningfulness, competence, choice and impact. Meaningfulness is individuals' assessment of their work objectives and purpose, depending on their value systems and standards (Thomas and Velthouse, 1990); competence refers to individuals' cognitive assessment of their ability to finish their work; choice means that individuals have choice of work behavior and process; and impact refers to the extent of individual performances impacting the results of organization's strategy, administration, management, operations and other aspects (Ashforth, 1989). Spreitzer (1995) developed a measurement instrument from four dimensions of meaning of work, competence, self-determination and impact, which were used widely in subsequent researches.

### *Psychological empowerment and employee's work performance*

Prior research has provided empirical evidence of a relationship between psychological empowerment and task performance (Aryee and Chen, 2006; Koberg *et al.*, 1999). Meaning of the work can enhance employees' awareness of the value of their job, which in turn motivates them to perform well (Eylon and Au, 1999; Spreitzer, 1995). When R&D employees are more confident of their competence, they act more proactively to achieve better performance. A meta-analysis conducted by Stajkovic and Luthans (1998) showed that there is a strong association between self-efficacy and work performance. Employees who possess self-determination at work are able to respond to demands of each unique situation, while those who are not allowed to take appropriate work-related actions feel helpless (Liden and Wayne, 2000). Furthermore, when R&D employees believe they can have impact on organizational outcomes, they are more likely to try harder, make their ideas heard and influence the direction of their work unit. All of these aspects of psychological empowerment encourage people to complete their tasks efficiently.

Some studies have indicated a relationship between psychological empowerment and contextual performance (e.g. Chiang and Hsieh, 2012; Walumbwa *et al.*, 2010; Wat and Shaffer, 2005). Chan (2003) argued that empowerment strategies can be characterized as interventions to enhance employees' self-efficacy and to intrinsically motivate them, thus creating a support-based relationship between management and employees. According to social exchange theory, employees reciprocate management's actions not only by performing their core tasks better, but also by adopting discretionary behaviors like organizational citizenship behaviors (Podsakoff *et al.*, 2000).

Employees who feel their jobs are meaningful have more confidence in their competence, experience high self-determination, have impact on the work and other people and are more likely to participate in out-of-the-role work.

The relationship between psychological empowerment and employees' creativity or innovation behavior has been investigated in prior researches (e.g. Singh and Sarkar, 2012; Sun *et al.*, 2012; Zhang and Bartol, 2010). Innovation is the process wherein people reorganize links among objects. It needs a loose and autonomous environment, where employees have inherent interest in, and motivation for, innovation. It is not a process in which we get expected results with simple control and influence of the outside world. When the empowered employees generate new ideas, using relevant knowledge, skills and abilities and solve work problems, they have a great sense of accomplishment and feel greatly capable (Redmond *et al.*, 1993). Spreitzer (1995) suggested that employees with high levels of psychological empowerment perceive that they have self-determination and influence, which further promotes their innovation performance. Zhang and Bartol (2010) found that psychological empowerment positively affected employees' creativity. Ertürk (2012) found that three of the four dimensions of psychological empowerment, namely, meaning, competence and impact were positively related to innovation capability. Thus, employees' perception of meaningfulness of job, individual self-efficacy, self-determination and impact lead to product innovation and new knowledge creation. Hence, we hypothesize:

- H1.* Psychological empowerment is positively related to task performance, contextual performance and innovation performance.

#### *Locus of control as a moderator*

Locus of control has been defined as an individual's belief or perception about the source of consequences in life (Rotter, 1966). Research suggests that internals, compared with externals, have higher job satisfaction, more respect for their leaders, feel less pressure of their roles, have greater sense of autonomy and control and enjoy longer tenures (Robbins, 2000; Spector, 1982; Thomas and Velthouse, 1990). They prefer conditions of self-control, while externals may perform better under external control (Gregory, 1978; Rotter, 1966). As Kren (1992) has argued, internals may have higher performance when managers use participative management style, while externals prefer the supervisory management style.

Psychological empowerment facilitates internals a perceived environment where the job is meaningful, competence is recognized, more freedom is given to make decisions and to respond to problems in their own way immediately and they are supported by colleagues (Spreitzer, 1995). In other words, psychological empowerment provides an individual a perception about his or her work's significance, self-efficacy, autonomy and work effects, thus providing an internal source of control. Hence, psychological empowerment motivates internals, who prefer a self-control perception (Spector, 1982), to perform better with confidence and commitment, take more initiative in generating and contributing new ideas and thoughts and have more enthusiasm to influence and help their colleagues. That is, they show a higher level of task performance, contextual and innovation performance.

In contrast, externals are relatively more passive and susceptible to external influence and cues and hence want their work to be arranged specifically and in detail (Kren, 1992; Spector, 1982). Since externals' inherent independence is relatively poor, a high level of psychological empowerment may bring them some stress and have less effect on their performance. Therefore, it can be expected that psychological

empowerment will improve the level of performance of internals more than externals. Therefore, our second hypothesis is:

- H2. Locus of control moderates the relation between psychological empowerment and task performance; contextual performance; and innovation performance, such that the relations are stronger for internals than for externals.

*Intrinsic work motivation as a mediator*

The concept of intrinsic motivation was first suggested by Woodworth (1918) and it was later expanded by White (1959). They argued that individual perceptions and actions are always driven by curiosity and self-protection such as play, curiosity and exploration, and this cannot be explained by the reinforcement theory, and would not occur because of external rewards or punishment. Ambrose and Kulik (1999) defined intrinsic motivation at work as a set of intrinsic propulsion of inspiring work practices, which determine the form, direction, effort and duration of work.

We assumed that psychological empowerment is positively related to employees' intrinsic work motivation. According to the theory of psychological empowerment, employees have the perception of empowerment only when their psychological states can stimulate their intrinsic motivation (Mishra and Spreitzer, 1998; Quinn and Spreitzer, 1997; Wilkinson, 1998). Thomas and Velthouse (1990) described psychological empowerment as increased intrinsic task motivation. Although this definition was widely accepted, little evidence was provided in the following studies to confirm the relationship between psychological empowerment and intrinsic task motivation.

The proponents of self-determination theory, Deci and Ryan (1985) suggested that people's intrinsic motivation depends on three factors: capacity, autonomy and correlated needs' satisfaction. Capability refers to individuals behaving proficiently and efficiently when interacting with the environment, most relevant to competency dimension of psychological empowerment; autonomy refers to people who tend to believe they are the masters of their actions and have the right to decide which action to take, which is conceptually related to the self-determination dimension. Relevance refers to people wanting to build valuable interpersonal relationships in the social environment and have a sense of belonging. It is closely related to the impact dimension. Hence, the impact of psychological empowerment on intrinsic work motivation is self-evident.

At the same time, intrinsic work motivation can influence employees' cognition, behavior and emotion, thus affecting their work performance. When an individual's behavior is regulated by intrinsic motivation, his/her actions show more stability and persistence and better performance and subjective satisfaction (Ryan, 1995). Previous studies suggest that intrinsic work motivation has a strong positive relationship with job satisfaction and has a negative impact on separation rate (Muchinsky and Tuttle, 1979) and absenteeism (Hackett, 1989), which are strongly related to performance. Baard *et al.* (2004) confirmed that self-determined work motivation has positive relationship with work performance. Therefore, we hypothesize that intrinsic work motivation inspires employees to work more proactively, assist colleagues and carry out innovation. Hence we hypothesize:

- H3. Intrinsic work motivation mediates the relation between psychological empowerment and task performance; contextual performance; and innovation performance.

## Method

### *Sample and procedures*

Data for this study were obtained from a large foreign-funded R&D institution located in Shanghai, China. Questionnaires were distributed to 280 employees and 105 supervisors. A cover letter attached to each questionnaire explained the objective of the survey and assured respondents of confidentiality of their responses and the voluntary nature of participation. The employees rated their perceived psychological empowerment, intrinsic work motivation and locus of control, while supervisors evaluated their subordinates' task performance, contextual performance and innovation performance. Completed questionnaires were sealed and returned directly to the researcher.

The response rate for employees and their immediate supervisors was 74 and 69 percent, respectively. After deleting incomplete questionnaires and records with unmatched employee-supervisor dyads, we had data from 209 R&D employees and 72 supervisors. In the supervisor sample, 66.7 percent were men, 72.2 percent had tenure over three years, 58.3 percent were between 31 and 40 years old, 68.1 percent were married and 65.3 percent had PhD degree. In the employee sample, 72.7 percent were men, 59.3 percent had tenure of three years or above, 76.1 percent were below 30 years old, 37.8 percent were married and 77.5 percent had PhD degree.

### *Measures*

*Psychological empowerment.* We measured employees' psychological empowerment using 12 items developed by Spreitzer (1995). A sample item is "the work I do is very important to me."

*Intrinsic work motivation.* We measured intrinsic work motivation using three items created by Blais *et al.* (1993). It required employees to indicate the reasons for which they are in their current job. A sample item is "because of the sense of achievement I experience while doing my job in a personal and unique way."

*Locus of control.* We assessed employees' locus of control with Spector's (1988) 16-item measure, for both internal and external dimensions. Sample items were "promotions are given to employees who perform well on the job" (internal LOC) and "getting the job you want is mostly a matter of luck" (external LOC). An overall LOC score was calculated by scoring the internal items reversely and higher scores reflected an external locus of control.

*Work performance.* Task performance was measured with five items from Podsakoff and MacKenzie (1989). Contextual performance was measured with 15 items used in Aryee *et al.* (2008). Innovation performance was assessed by nine items based on Janssen's (2001) scale. Sample items were "this worker always completes the duties specified in his/her job description" (task performance), "this employee would praise coworkers when they are successful" (contextual performance) and "creating new ideas for improvements" (innovation performance). All the above items were rated on a six-point Likert scale ranging from "1 = strongly disagree" to "6 = strongly agree."

*Control variables.* We controlled for four sociodemographic variables of gender (1 = male, 2 = female), organizational tenure (in years), education level (1 = below bachelor, 2 = bachelor, 3 = master, 4 = doctor and 5 = post doctor) and position level (1 = employee, 2 = supervisor, 3 = manager and 4 = director) in the current study since these variables have been found to be related to work performance, psychological empowerment or locus of control in previous studies (e.g. Spreitzer *et al.*, 1997; Zhang and Bartol, 2010; Ng and Feldman, 2009).

## Results

Totally, two sets of confirmatory factor analysis were performed to test for discriminant validity. The first involved a comparison of the relative fit of three-, two- and single-factor measurement models for both employee's evaluation of their own psychological empowerment, intrinsic work motivation and locus of control and supervisors' evaluation of their subordinates' performances. The second set of confirmatory factor analysis examined the full measurement model with the six variables.

Joreskog and Sorbom (1986) noted that models with more than 30 indicators are exceedingly difficult to fit even with strong theoretical support. Therefore, item parcels approach is frequently recommended to reduce the number of parameters (Hall *et al.*, 1999; Little *et al.*, 2002; Mathieu and Farr, 1991). Following Mathieu and Farr (1991), we established three indicators for each construct by first averaging the highest and lowest loadings items to form the first indicator and then the next highest and lowest loadings items for the second indicator, and so forth, until all items were assigned to one of the three indicators for each construct.

As shown in Table I, the results indicated that the three-factor model for the items from employees' evaluation provided a good fit. RMSEA score was below 0.08 (Hoyle and Panter, 1995) and GFI, CFI and NFI scores were above 0.90 (Bentler and Bonett, 1980; Bollen, 1989), which indicated that the indices fall within good fit norms. We compared the three-factor model to single-factor and two-factor models and found that the three-factor model produced a significant improvement in  $\chi^2$ , which suggests a better fit than the single-factor or two-factor models (Schumacker and Lomax, 1996). The three-factor model for the items from supervisors' evaluation also provided a good fit and had a significant improvement in  $\chi^2$  than single-factor or two-factor models. For the full measurement model, the results also indicated a good fit. These results indicated that these measurement items are highly reliable for measuring the present constructs.

The means, standard deviations, reliability coefficients and correlations among the study variables are presented in Table II. It shows that psychological empowerment and intrinsic work motivation are strongly correlated with task performance, contextual performance and innovation performance positively; locus of control is negatively correlated with other variables. This provides initial support for *H1* and *H3*.

Table III shows the results of hierarchical regression analysis. On the basis of Aiken and West (1991), we mean-centered all independent variables that constituted an interaction term to mitigate the potential threat of multi-collinearity. The results indicated that after controlling for the effects of gender, educational background, tenure and position, psychological empowerment was significantly related to task performance ( $\beta = 0.51$ ,  $p < 0.01$ ), contextual performance ( $\beta = 0.50$ ,  $p < 0.01$ ) and innovation performance ( $\beta = 0.48$ ,  $p < 0.01$ ). Therefore, *H1* was supported.

The results show that locus of control moderates both the relationship between psychological empowerment and contextual performance ( $\beta = -0.20$ ,  $p < 0.01$ ) as well as innovation performance ( $\beta = -0.18$ ,  $p < 0.01$ ). However, locus of control does not moderate the relationship between psychological empowerment and task performance. Therefore, *H2* is partially supported.

We followed the analysis procedure suggested by Aiken and West (1991) and used one standard deviation above and below the mean of locus of control (see Figures 1 and 2) to plot the interaction effects. Figures 1 and 2 graphically depict the results of the moderating effects of locus of control. As predicted, although the psychological

Model	Factors	$\chi^2$	df	$\Delta\chi^2$	RMSEA	NFI	CFI	GFI
Six factors model	PE, LOC, IM, TP, CP and IP	260.18	120	–	0.07	0.94	0.97	0.90
Three factors model <sup>a</sup>	PE, LOC and IM	39.40	24	–	0.07	0.97	0.98	0.96
Two factors model <sup>a</sup>	Combined LOC and IM into one factor	134.13	26	49.65**	0.16	0.91	0.92	0.87
	Combined IM and PE into one factor	89.05	26	166.18**	0.12	0.93	0.95	0.91
	Combined LOC and IM into one factor	205.58	26	235.72**	0.20	0.85	0.86	0.82
Single factor model <sup>a</sup>	Combined PE, LOC and IM into one factor	275.12	27	49.65**	0.23	0.82	0.84	0.77
Three factors model <sup>b</sup>	TP, CP and IP	43.24	24	–	0.06	0.98	0.99	0.96
Two factors model <sup>b</sup>	Combined TP and CP into one factor	51.30	26	8.06*	0.07	0.98	0.99	0.95
	Combined TP and IP into one factor	238.68	26	195.44**	0.19	0.91	0.93	0.80
	Combined CP and IP into one factor	312.14	26	268.90**	0.23	0.89	0.90	0.75
Single factor model <sup>b</sup>	Combined TP, CP and IP into one factor	323.36	27	280.12**	0.23	0.88	0.89	0.74

**Notes:** PE, psychological empowerment; LOC, locus of control; IM, intrinsic motivation; TP, task performance; CP, contextual performance; IP, innovation performance. <sup>a</sup>For the items from employee's evaluation; <sup>b</sup>for the items from supervisor's evaluation. \* $p < 0.05$ ; \*\* $p < 0.01$

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**Table I.**  
Comparison of  
measurement models

empowerment – contextual and innovation performance relationships were positive for employees possessing either an internal or an external locus of control, the relationship was stronger for internals.

We followed Baron and Kenny's (1986) three-step procedure to test *H3*. First, psychological empowerment was found significantly related to intrinsic work motivation ( $\beta_{MI} = 0.49, p < 0.01$ ); second, psychological empowerment was found to be related to performance ( $\beta_{ip} = 0.51, \beta_{cp} = 0.50, \beta_{ip} = 0.48, p < 0.01$ ); and third, the effects of psychological empowerment on task performance ( $\beta = 0.51 \rightarrow 0.39, p < 0.01$ ), contextual performance ( $\beta = 0.50 \rightarrow 0.36, p < 0.01$ ) and innovation performance ( $\beta = 0.48 \rightarrow 0.40, p < 0.01$ ) became smaller but remained statistically significant, when intrinsic work motivation was entered into the regression equation.

Furthermore, based on Preacher and Hayes (2004), we used bootstrap confidence intervals to test the mediation hypotheses. The confidence interval for the indirect effect of psychological empowerment on work performance through intrinsic work motivation excluded zero for task performance (0.02  $\rightarrow$  0.10), contextual performance (0.03  $\rightarrow$  0.11) and innovation performance (0.01  $\rightarrow$  0.10), indicating that intrinsic work motivation mediated the relation between psychological empowerment and work performance. Therefore, *H3* is supported.

## Discussion

The purpose of this research was to elaborate and test the psychological mechanism and boundary conditions of how psychological empowerment affects R&D employees'

**Table II.**  
Means, standard deviations, reliabilities and correlations among study variables

	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. Gender	1.25	0.43	-									
2. Education	2.24	0.83	0.07	-								
3. Tenure	3.64	1.24	-0.03	0.11	-							
4. Position	1.21	0.52	-0.06	0.32**	0.35**	-						
5. Psychological empowerment	4.61	0.53	0.01	0.15*	0.10	0.27**	(0.85)					
6. Intrinsic motivation	4.57	0.56	-0.08	0.06	-0.04	0.19**	0.50**	(0.74)				
7. Locus of control	2.97	0.49	0.01	0.01	-0.03	-0.12	-0.44**	-0.44**	(0.80)			
8. Task performance	4.93	0.52	0.08	0.09	0.01	0.03	0.48**	0.40**	-0.24**	(0.81)		
9. Contextual performance	4.78	0.46	0.03	0.12	-0.04	0.12	0.50**	0.46**	-0.25**	0.75**	(0.82)	
10. Innovation performance	4.72	0.54	-0.10	0.13*	-0.05	0.04	0.46**	0.37**	-0.10	0.59**	0.70**	(0.90)

**Notes:** Cronbach  $\alpha$  coefficients for multi-item scales are reported in parentheses. Gender was dummy-coded as "1-male and 2-female"; Education was dummy-coded as "1-below bachelor, 2-bachelor, 3-master, 4-doctor, and 5-post doctor"; tenure was reported by years; position was dummy-coded as "1-employee, 2-supervisor, 3-manager, and 4-director". \* $p < 0.05$ ; \*\* $p < 0.01$

	Intrinsic motivation				Task performance				Contextual performance				Innovation performance				
	M1	M1	M2	M3	M4	M1	M2	M3	M4	M1	M2	M3	M4	M1	M2	M3	M4
1. Control variables																	
Gender	-0.09	0.07	0.07	0.08	0.09	0.03	0.03	0.05	0.05	0.03	0.03	0.05	0.05	-0.11	-0.11	-0.09	-0.09
Education	-0.04	0.06	0.06	0.06	0.07	0.06	0.06	1.07	0.07	0.06	0.06	1.07	0.07	0.09	0.08	0.08	0.09
Tenure	-0.13*	-0.01	-0.01	-0.00	0.02	-0.10	-0.09	-0.09	-0.06	-0.10	-0.09	-0.09	-0.06	-0.08	-0.08	-0.08	-0.06
Position	-0.11	0.12	0.12	0.12	0.15*	0.00	0.00	0.02	0.03	0.00	0.00	0.02	0.03	0.10	0.10	0.11	0.12
2. Predictor																	
Psychological Empowerment (PE) (PCB)	0.49**	0.51**	0.49**	0.49**	0.39**	0.50**	0.48**	0.49**	0.36**	0.50**	0.48**	0.49**	0.36**	0.48**	0.54**	0.54**	0.40**
3. Moderator																	
Locus of Control (LOC)			-0.04	-0.05			-0.04	-0.07			-0.04	-0.07			0.12	0.08	
4. Interactive effects																	
PE × LOC				-0.06				-0.20**								-0.18**	
5. Mediator																	
Intrinsic Motivation					0.23**				0.27**								0.17*
F	15.86**	13.71**	11.46**	9.98**	13.86**	14.48**	12.08**	12.39**	15.70**	14.48**	12.08**	12.39**	15.70**	13.28**	11.70**	11.68**	12.33**
df	5,203	5,203	6,202	7,201	6,202	5,203	6,202	7,201	6,202	5,203	6,202	7,201	6,202	5,203	6,202	7,201	6,202
R <sup>2</sup>	0.28	0.25	0.25	0.26	0.29	0.26	0.26	0.30	0.32	0.26	0.26	0.30	0.32	0.25	0.26	0.29	0.27
ΔR <sup>2</sup>	-	-	0.00	0.01	0.04**	0.00	0.00	0.04**	0.06**	0.00	0.00	0.04**	0.06**	0.01	0.03**	0.03**	0.02*

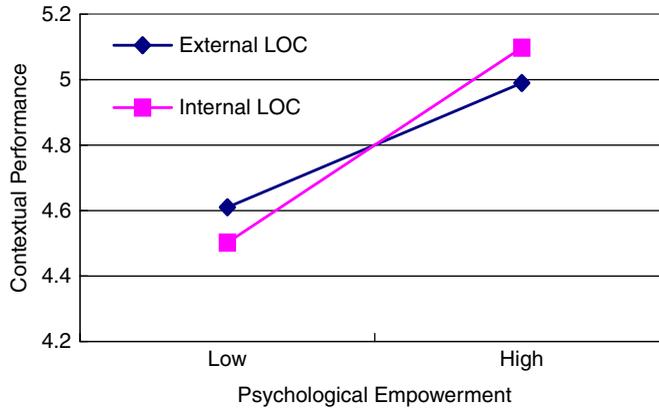
Notes: \* $p < 0.05$ ; \*\* $p < 0.01$ Table III.  
Results of hierarchical regression analysisMotivation  
relation to  
performance

work performance. We verified positive relationships between psychological empowerment and task, contextual and innovation performance based on the data of 209 R&D employees and their supervisors in China, examined the moderating effects of employees' locus of control and explored the mechanism of psychological empowerment affecting the three types of performance by investigating intrinsic work motivation as a mediator.

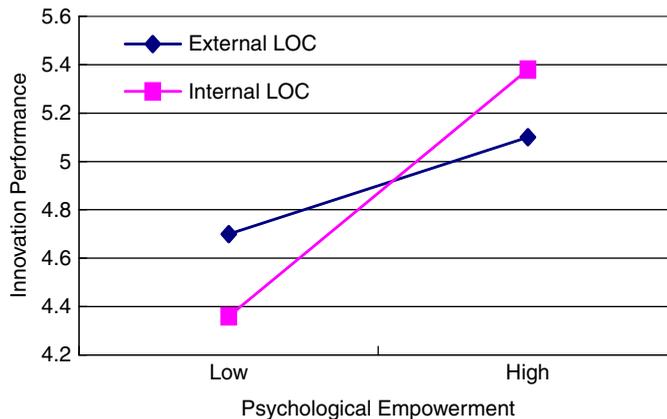
*Theoretical implications*

First, prior research findings on the role of psychological empowerment as antecedents of task performance (e.g. Hempel *et al.*, 2012; Spreitzer *et al.*, 1997), contextual performance (e.g. Walumbwa *et al.*, 2010; Wat and Shaffer, 2005) and innovation performance (e.g. Singh and Sarkar, 2012; Zhang and Bartol, 2010) are replicated in this study. Results show that psychological empowerment positively affects the work performance. Especially, our findings provide initial evidence of the above relationship in knowledge intensive industries in China.

**Figure 1.**  
Moderating effect of locus of control on relationship between psychological empowerment and contextual performance



**Figure 2.**  
Moderating effect of locus of control on relationship between psychological empowerment and innovation performance



Second, the current research is the first to explore the moderating role of locus of control in relationships between psychological empowerment and R&D employees' work performance. In particular, our results indicate that the effects of psychological empowerment on R&D employees' contextual and innovation performances are stronger for internals than for externals. These results extend the prior research by exploring a boundary condition of psychological empowerment effectiveness (Seibert *et al.*, 2011).

Surprisingly, the moderating effect of locus of control on psychological empowerment and task performance is not confirmed. The reason may be that task performance is the basic requirement listed in their job descriptions while contextual and innovation performances are expected to go above and beyond the basic requirements (Janssen and Van Yperen, 2004; Motowidlo and Van Scotter, 1994). Because of their stronger self-control and self-efficacy (Phillips and Gully, 1997), internals have high motivation to achieve an acceptable level of performance, even without experiencing psychological empowerment. Hence, the impact of psychological empowerment on internals' task performance does not show significant difference, compared with externals.

Third, our results indicate that intrinsic motivation partially mediates the impact of psychological empowerment on work performance of R&D employees. These findings partially support the idea that intrinsic work motivation explains why psychological empowerment affects employees' performance. More importantly, intrinsic motivation explains incremental variance of work performance over psychological empowerment (as shown in regression Model 4), which is different from Thomas and Velthouse's (1990) classic argument on intrinsic motivation – empowerment relationship. In their work, psychological empowerment is described as increased intrinsic task motivation. However, our results at least show that psychological empowerment and intrinsic task motivation are not the same, which extends current understanding about the connotation of psychological empowerment.

#### *Implications for practitioners*

There are several practical implications that can be derived from our findings. First, increasing psychological empowerment is an effective way to promote R&D employees' performance. Managers, especially those who are facing fierce competition and who are eager for innovation, should enhance employees' perception of the value of their work, affirm their working capacity, define well the scope of their own decisions and emphasize their effect on the work. These strategies can enhance R&D employees' dedication to the tasks, active promotion of inter-personal solidarity and innovation and in turn lead to organizational effectiveness and competitiveness.

Second, although managers should create psychological empowerment for both internals and externals, greater perception of psychological empowerment should be created especially for internals, because the contextual and innovation performance of internals are more sensitive to psychological empowerment's effects.

Third, by creating higher levels of intrinsic work motivation, psychological empowerment can have a more positive, albeit indirect, effect on employees' performance. Furthermore, if the level of employees' psychological empowerment is hard to be changed in a short time, the supervisors can consider other ways to change employees' intrinsic work motivation for higher work performance.

*Limitations and directions for future research*

Our study is limited in several respects. An obvious limitation is that the data comes from a R&D institution located in Shanghai, China. Although we found significant results, future research with a variety of samples is needed to bolster confidence in our results. Second, given the cross-sectional nature of the data, the direction of causality cannot be unambiguously determined. Carefully designed longitudinal studies are needed to test the effects of psychological empowerment on employees' work performance. Third, all variables involved in this study are at the individual level. Clearly, however, a range of organizational level variables are possible, such as organizational structure and climate (Sparrowe, 1994). These and other limitations notwithstanding, we hope that this study spurs other researchers to explore how psychological empowerment, individual differences and organizational context interact to influence work performance and the underlying psychological mechanism.

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