

Research on the Impacts of Servant Leadership on R&D Employee Creativity: Based on the Social Information Processing Perspective

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Abstract. The creativity of R&D employees is a crucial factor of enterprise competitiveness and organizational effectiveness. Leaders in organization have a big influence on R&D employee creativity. This study explores the effect of servant leadership on the creativity of R&D employees with the social information processing and regulatory focus perspective. This study takes 303 R&D staff in a domestic enterprise as research sample and collects data by questionnaire. The research finds that servant leadership is positively related to R&D employees' promotion focus and prevention focus significantly. R&D employees' promotion and prevention focus mediate the relationship between servant leadership and R&D employee creativity. Leader-member exchange moderates the relationship of servant leadership-R&D employees' promotion focus and it also moderates the relationship between servant leadership and R&D employees' prevention focus. This study can not only enrich the study of R&D employee creativity, but also has practical value to corporations.

Keywords: servant leadership; leader-member exchange; R&D employees' promotion focus; R&D employees' prevention focus; R&D employee creativity.

1. Introduction

With the rapid development of globalization, enterprises need to survive in a more changeable market environment. Corporations must constantly improve their innovation ability to raise organizational efficiency and maintain their competitiveness in today's knowledge economy era. R&D employees usually do a lot of creative tasks and produce innovative ideas to solve problems in organization, thus they play an important role in innovation of enterprise and have positive effect on the sustainable development and organizational performance of enterprises in current commercial environment [1]. Therefore, it draws attention of scholars on how to improve the creativity of R&D employees in organization. According to social information processing theory [2], environmental factors can influence individual attitudes and behaviors in the workplace. Amabile et al. believe that as an important part of organizational environment, leaders can have many direct or indirect interactions with employees and these interactions have an important impact on employees' creativity [3]. As a new kind of leadership in organization, servant leadership has been proved to play a positive role in maintaining organizational competitiveness and organizational development [4]. However, few scholars focus on the relationship between servant leadership and R&D employees. Therefore, this study intends to prove the positive relationship between servant leadership and R&D employees' creativity and explore the underlying mechanism and boundary condition of servant leadership on R&D employees' creativity.

2. Theory and Hypotheses

2.1 Servant Leadership, R&D Employees' Promotion Focus and R&D Employees' Prevention Focus

Servant leadership refers to a leadership practice that places employees interests beyond leaders and focuses on serving and promoting development of employees [5]. Servant leaders care for satisfying the needs of their followers and also are willingly to hear thoughts and ideas of them. At the same time, these leaders attach importance to the growth and development of employees and are willing to give employees more opportunities and resources.

According to social information processing theory [2], R&D employees will evaluate the behaviors of leaders in the organization, and then adjust their attitudes and behaviors such as self-regulation focus. In the organization, R&D employees' with promotion focus usually pay more attention to their success and self-development in career than others and often attempt to use new ways to solve problems [6]. While servant leaders also attach importance to the development of employees' ability and often give them opportunities to learn and support them to find different solutions and create new ideas in work [7]. Therefore, R&D employees will be more confident in facing problems and have the courage to be creative even if it may bring them to make mistakes. Based on this, we propose:

H1: Servant leadership will positively relate to R&D employees' promotion focus.

At the same time, according to the regulatory focus theory, employees with prevention focus usually pay more attention to responsibilities and obligations than others [6]. They are afraid of failures and mistakes, so they tend to use conservative methods to solve problems and meet their safety needs. Servant leaders can not only help employees accomplish their tasks, but also give them encouragement and respect and create a relaxing work environment for them [8]. Therefore, for R&D employees' with prevention focus, the trust and encouragement from servant leaders can make them feel a sense of security psychologically, and reduce their worries about failure and mistakes, and thus have a negative effect on their focus on prevention. Therefore, based on the above analysis, we propose:

H2: Servant leadership will negatively relate to R&D employees' prevention focus.

2.2 R&D Employees' Promotion Focus, R&D Employees' Prevention Focus and R&D Employee Creativity

Creativity refers to the new and useful ideas about products, practices and procedures that employees generate in workplace [9]. According to Sacramento et al.'s study, the regulatory focus of employees has an important influence on their creativity [10]. R&D employees' with promotion focus tend to be more sensitive to positive results and eager to seize opportunities to try new things, thus they have more innovation ideas. While R&D employees' with prevention focus are more sensitive to negative results. In order to avoid mistakes, they will be more cautious to try fewer new ways which has a negative effect on their creativity. Therefore, we suggest that promotion focus has a positive effect on R&D employee creativity, while prevention focus has a negative effect on R&D employee creativity. According to hypothesis H1 and H2, we propose that servant leadership is positively related to R&D employees' promotion focus and negatively related to their prevention focus. Thus we propose that:

H3a: R&D employees' promotion focus will mediate the relationship between servant leadership and R&D employee creativity.

H3b: R&D employees' prevention focus will mediate the relationship between servant leadership and R&D employee creativity.

2.3 The Moderating Effects of Leader-member Exchange

Based on contingency theory [11], leader-member exchange can influence the effectiveness of servant leaders. Leader-member exchange (LMX) refers to the different quality exchange relationship established between leaders and subordinates in work [12]. When servant leaders and R&D employees establish a high-quality LMX, they will trust each other and the employees will have a higher sense of identity to the leaders. Previous studies found that employees with a high sense of identity of their leader are more willing to support the leader's behavior and tend to make consistent decisions with the leader [13]. Therefore, with high-quality LMX, R&D employees are more likely to perceive and be influenced by leaders' behaviors [14]. On the contrary, when servant leaders and R&D employees have low-quality LMX, the relationship between R&D employees and leaders is only based on the contract and lack of informal communication ways. So it's difficult for them to establish a close emotional connection [14]. At this time, it's hard for R&D employees to trust and depend on their leader, so they have a low sense of identity to leaders. It's not easy for R&D

employees to perceive and learn the positive behaviors of servant leaders [5]. Therefore, we propose the following hypothesis:

H4: LMX will moderate the relationship between servant leadership and R&D employees' promotion focus such that servant leadership will be more strongly related to R&D employees' promotion focus when LMX is high rather than low.

H5: LMX will moderate the relationship between servant leadership and R&D employees' prevention focus such that servant leadership will be more strongly related to R&D employees' prevention focus when LMX is high rather than low.

The conceptual model is as shown in Figure 1.

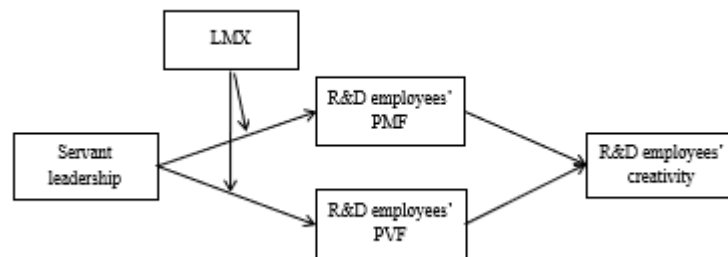


Fig. 1 Conceptual Model

3. Method

3.1 Sample and Procedure

Our sample is from 325 R&D staff in a pharmaceutical company in China. To avoid common method bias, we use a leader-subordinate pairing method to collect data by questionnaire. After the collection, the leader and employee questionnaires are separately collected and are matched analyzed. A total of 325 participants participated in the study and 303 participants completed this research (response rate = 93.23%).

3.2 Measures

A 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree) was used to measure all main variables in our study. We asked them to translate all original English measures into Chinese using the translation and back-translation procedure.

Servant leadership. We measured it using 7 items from Liden et al.(2014). A sample item is “My leader considers others' needs and interests above his/her own”. Cronbach’s α for this scale was .95.

LMX. We measured it using 7 items from Scandura and Graen(1995). A sample item is “My supervisor understands my job problems and needs”. Cronbach’s α for this scale was .93.

R&D employees’ promotion focus. We measured it using 3 items from Shin et al.(2017). A sample item is “I often do well at things that I try”. Cronbach’s α for this scale was .92.

R&D employees’ prevention focus. We measured it using 3 items from Neubert et al.(2008). A sample item is “Not being careful enough has gotten me into trouble at times”. Cronbach’s α for this scale was .91.

R&D employee creativity. We measured it using 4 items from Baerand Oldham(2006). A sample item is “This employee often creates new ideas for improvement”. Cronbach’s α for this scale was .91.

4. Results

4.1 Construct Validity Evidence

We conducted a series of confirmatory factor analyses (CFAs) in Amos to examine the construct validity of our variables at the individual level. As shown in Table 1, we can see Model 1 shows the well fit indices ($\chi^2/df=3.62$, RMSEA=0.09, CFI=0.91, IFI=0.91, TLI=0.89, SRMR=0.03). And, the

other models show worse fit than model 1. These results supported the discriminant validity of our variables.

Table 1. Comparison of Measurement Models

Model	χ^2	df	χ^2/df	RMSEA	CFI	TLI	SRMR
Model 1:SL, PMF, PVF, LMX, CRE	875.54	242	3.62	.09	.91	.89	.03
Model 2:SL+LMX, PMF, PVF, CRE	1828.54	248	7.374	.15	.76	.74	.07
Model 3:SL+LMX, PMF+CRE, PVF	1978.895	249	7.94	.15	.74	.71	.05
Model 4:SL+LMX, PMF+PVF+CRE	2785.45	251	11.10	.18	.62	.58	.07
Model 5:SL+PMF+PVF+LMX+CRE	3437.55	252	13.64	.21	.52	.49	.08

Note: SL=servant leadership, PMF= R&D employees' promotion focus, PVF=R&D employees' prevention focus, LMX=leader-member exchange, CRE= R&D employee creativity.

4.2 Descriptive Statistics

Table 2 reports descriptive statistics and the correlations among all the study variables. We can see that servant leadership is positively related to R&D employees' promotion focus ($r=0.56$, $p<0.01$), and is negatively related to R&D employees' prevention focus ($r=-0.31$, $p<0.01$). The mediator, R&D employees' promotion focus, is positively related to R&D employee creativity ($r=0.26$, $p<0.01$). The other mediator, R&D employees' prevention focus, is negatively related to R&D employee creativity ($r=-0.19$, $p<0.01$).

Table 2. The Descriptions and Correlations of Main Variables

Variables	Mean	SD	1	2	3	4	5	6	7	8	9
1. Age	29.16	7.09									
2. Gender	.72	.45	-.07								
3. Education	2.01	.29	-.07	-.14*							
4. Tenure	3.17	4.85	.55**	-.12*	.03						
5. SL	4.14	.48	-.08	-.01	-.04	.10	(.95)				
6. PMF	4.06	.60	.02	-.09	-.01	.11	.56**	(.92)			
7. PVF	2.05	.79	.06	.04	.02	-.10	-.31**	-.50**	(.91)		
8. LMX	4.10	.53	-.06	-.01	-.09	.03	.70**	.52**	-.22**	(.93)	
9. CRE	3.94	.62	-.14*	-.07	-.04	-.05	.08	.26**	-.19**	.16**	(.91)

Note: *** $p<.001$, ** $p<.01$, * $p<.05$. SL=servant leadership, PMF= R&D employees' promotion focus, PVF=R&D employees' prevention focus, LMX=leader-member exchange, CRE= R&D employee creativity.

4.3 Hypotheses Testing

The results from our tests of H1 and H2 are reported in Tables 3. We examined H1 in Model 2, we can see that servant leadership was positively related to R&D employees' promotion focus ($\beta=0.56$, $p<0.001$). Thus, H1 was supported. In addition, we examined H2 in Models 6, we can see servant leadership was negatively related to R&D employees' prevention focus ($\beta=-0.29$, $p<0.001$). Thus, H2 was supported.

To test H3a, we conducted a bootstrapping-based mediation test using the PROCESS macro. Results revealed that servant leadership was associated with R&D employee creativity, mediated by R&D employees' promotion focus (indirect effect = .23, 95% CI = .12 to .34). Thus, H3a was supported.

Table 3. Results of Regression Analyses

Model	PMF				PVF				CRE			CRE		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Age	-.07	.05	.04	.07	.17*	.11	.11	.08	-.16*	-.15*	-.17*	-.17*	-.15*	-.13
Gender	-.08	-.07	-.07	-.05	.04	.03	.03	.02	-.09	-.08	-.06	-.09	-.08	-.08
Education	-.03	.01	.02	.03	.04	.02	.02	.01	-.06	-.06	-.06	-.06	-.06	-.06
Tenure	.14	.02	.03	.01	-.20*	-.13	-.13	-.11	.03	.02	.02	.03	.02	-.01
SL		.56***	.38***	.48***		-.29**	-.27**	-.37**		.06	-.12		.06	.01
PMF											.32**			
PVF												-.17*		-.17*
LMX			.26***	.24***			-.02	-.01						
SL × LMX				.29***				-.27**						
R ²	.02	.33	.36	.43	.03	.11	.11	.18	.03	.03	.10	.03	.03	.06
ΔR ²	.02	.31***	.03***	.08***	.03	.08***	.00	.07***	.03	.01	.07**	.03	.01	.03**
F	1.58	28.63**	27.65**	32.38**	2.39	7.25***	6.03***	8.95***	2.27	2.03	5.67***	2.27	2.04	3.16**

Note: *** p<.001, ** p<.01, * p<.05. SL=servant leadership, PMF=R&D employees' promotion focus, PVF=R&D employees' prevention focus, LMX=leader-member exchange, CRE= R&D employee creativity.

To test H3b, we also conducted a bootstrapping-based mediation test using the PROCESS macro. Results revealed that servant leadership was associated with R&D employee creativity, mediated by R&D employees' prevention focus (indirect effect = .07, 95% CI = .04 to .12). Thus, H3b was supported.

The results from our tests of H4a and H4b are reported in Tables 3. We examined H4a in Model 4, we can see that the interaction of servant leadership and LMX was significant (β=0.29, p<0.001). Thus, H4a was supported. In addition, we utilized the methods of Hayes (2013) to test H4a in an integrative fashion at one standard deviation above and below the mean of the moderator. As shown in Figure2, H4a was further supported.

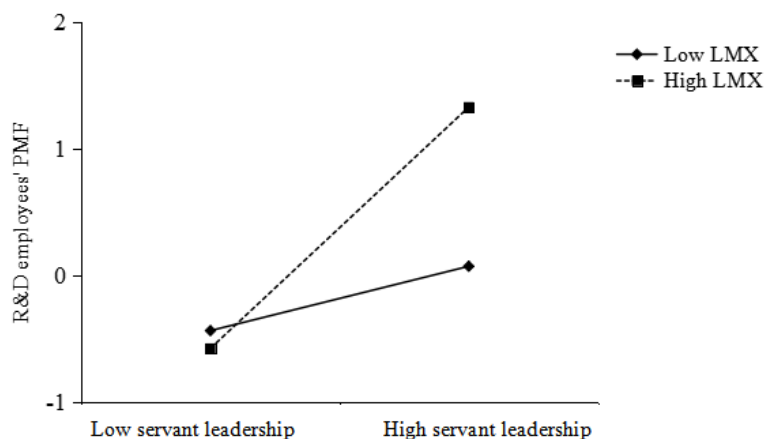


Fig 2. The Moderating Role of R&D Employees' Promotion Focus in the Relationship between Servant Leadership and R&D Employee Creativity

We examined H4b in Models 8 and can see that the interaction of servant leadership and LMX was significant ($\beta=-0.27, p<0.001$). Thus, H4b was supported. In addition, we utilized the methods of Hayes (2013) to test H4b in an integrative fashion at one standard deviation above and below the mean of the moderator. As shown in Figure3, H4b was further supported.

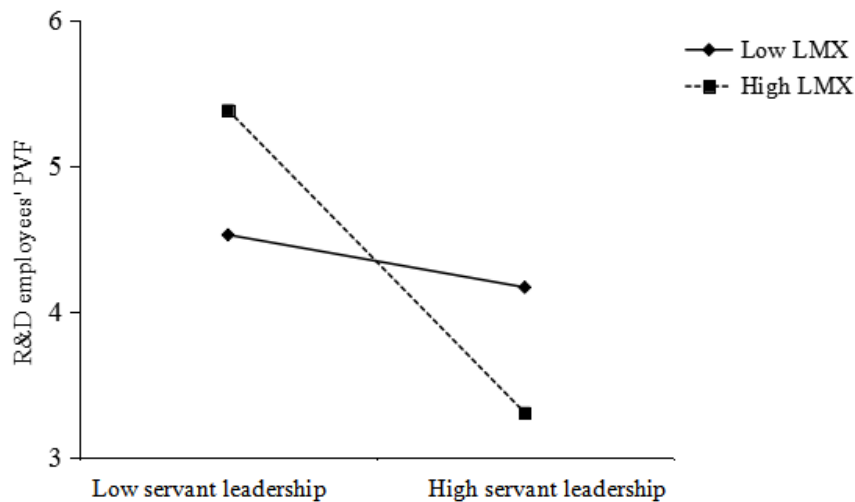


Fig 3. The Moderating Role of R&D Employees' Prevention Focus in the Relationship between Servant Leadership and R&D Employee Creativity

5. Discussion

5.1 Conclusion

This study takes 303 R&D staff in a domestic enterprise as research sample and finds that servant leadership is positively related to R&D employees' promotion focus significantly and it's negatively related to R&D employees' prevention focus significantly. R&D employees' promotion and prevention focus mediate the relationship between servant leadership and R&D employee creativity. Leader-member exchange moderates the relationship between servant leadership and R&D employees' promotion focus such that servant leadership will be more strongly related to R&D employees' promotion focus when LMX is high rather than low. LMX also moderates the relationship between servant leadership and R&D employees' prevention focus such that servant leadership will be more strongly related to R&D employees' prevention focus when LMX is high rather than low.

5.2 Theoretical Implications

Our findings provide several theoretical implications. First, we found servant leadership can effect R&D employees' promotion and prevention focus. This study can not only enrich the study of R&D employee creativity and new antecedents of regulatory focus, but also contributes to the literature of social information processing theory and regulatory focus theory. Second, we found R&D employees' regulatory focus mediated the relationship between servant leadership and R&D employee creativity. Our study provides a more complete understanding of the mechanism of how servant leadership effects R&D employee creativity. Third, we found that LMX will moderate the indirect effect of servant leadership on R&D employees' regulatory focus. This provides a new perspective on the study of the relationship between servant leadership and regulatory focus, and advances the study of LMX.

5.3 Practical Implications

This study also has practical implications. First, entrepreneurs should pay attention to the training of servant leadership. Leaders can take some lessons on how to encourage and support their followers to improve their creativity. Second, supervisors should help followers strengthen their promotion focus and give more patience and freedom to employees with prevention focus. Third, entrepreneurs

should make leaders pay attention to the relationships with their followers and encourage them to build a high-quality leader-member exchange relationship.

5.4 Limitations and Future Research

Although the results are generally consistent with all predictions in our study, it is important to note some limitations that present opportunities for future research. First, in our study, although the measures of main variables are based on employees and leaders self-report, it will also leads to common method variance. So, future work should measure these variables with other resources. Second, we use questionnaires to collect data in this study, so we can only find the correlation of variable instead of causality of variables. Future work can do some experiments to collect data. Third, this study confirmed the relationship of variables from individual level. Future research may extend study to team level and explore other antecedents and influencing mechanism of team creativity.

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