# Relationships between Developmental Feedback, Intrinsic Motivation, and Creative Personality and Performance\*

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Developmental feedback can motivate employees to take chances and be more creative, at least for employees who interpret feedback as support for new ideas. Drawing on cognitive evaluation theory, we examined relationships between developmental feedback, intrinsic motivation, creative personality (e.g., people who describe themselves as inventive and confident rather than cautious and conservative), and creative performance. We predicted that developmental feedback would contribute to employees' intrinsic motivation and further improve their creative performance, especially those who were high in creative personality. The sample included 215 Chinese employees and their direct supervisors from a big science and technology corporation in Beijing, China. Employees' perceptions of developmental feedback from their supervisors' ratings of employees' creative performance. Also, intrinsic motivation of employees mediated the relationship between developmental feedback and their creative performance. These relationships were stronger for employees with a highly creative personality.

Keywords: developmental feedback, intrinsic motivation, creative personality, creative performance, Chinese employees

## Highlights:

• First study about the relationships between developmental feedback, intrinsic motivation, and creative personality and performance in Chinese employees.

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- Developmental feedback is positively correlated with intrinsic motivation and creative performance, especially for employees with highly creative personalities.
- Intrinsic motivation mediates the relationship between developmental feedback and creative performance.

The creativity of employees is the main source of organizational innovation and competitive advantage. Creative performance is "the generation of novel and useful ideas, processes, products or procedures by employees in their everyday work" (Baer et al., 2003). As a result, factors affecting creative performance have received increased attention among organizational theorists and researchers recently (Malik et al., 2015; Zhang et al., 2017; Hughes et al., 2018). Supervisors play a crucial role in cultivating or, in some cases, impeding employee's creative performance (Shin & Zhou, 2003; Byron & Khazanchi, 2012; Lin et al., 2016). Supervisor feedback can promote subordinates' performance (London & Smither, 1995; Malik et al., 2015), especially their creative performance. However, the existing research on the relationship between supervisor feedback and employee creative performance is inconsistent (Zhang et al., 2017). For example, Baas et al. (2008) pointed out positive feedback is related to higher creative performance by increasing subordinate's cognitive flexibility and global information. Contrary to this, Podsakoff and Farh (1989) noted that, compared with positive feedback, negative feedback is more conducive to the cultivation of creative performance. Therefore, these conflicts confuse managers' understanding of the types of feedback that might improve employees' creative performance.

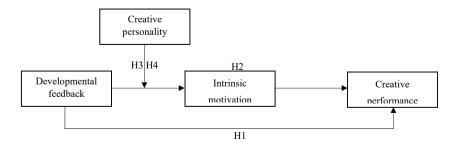
There are two likely reasons for these inconsistencies in findings about the relations between supervisor feedback and employee's creative performance: One reason is that some studies only focus on the role of the supervisor in the feedback process, while ignoring employees' perception of supervisor feedback. (Steelman et al., 2004). Another reason is that most of the previous studies overlooked the individual characteristics of employees and the organizational context in the employee's interpretation of supervisor feedback (Zhang et al., 2017). In addition, creative performance has two basic conditions: (1) it should be original and novel, and (2) it should be useful or beneficial for the organization (Oldham & Cummings, 1996). Creativity requires employees to devote energy and take risks (Byron & Khazanchi, 2012; Zhao & Guo, 2018) and therefore they can benefit from supportive and detailed feedback that encourages learning and improvement (Zhou, 2003). Such feedback can motivate employees to be more interested in their work, open to new ideas, and engaged in generating innovations (George & Zhou, 2007; Runco & Acar, 2012).

Here, we focus on the relationships between developmental feedback and creative performance. As depicted in Figure 1, we suggest that employees' intrinsic motivation will mediate the relationships between developmental feedback and their creative performance and that creative personality will moderate those relationships among them. We test these relationships in a sample of employees and their direct supervisors in a Chinese science and technology company. Generally, compared with western employees, Chinese employees care more about feedback coming from their supervisors (Huo & Von, 1995; Zhang et al., 2017). However, supervisor feedback focused on an individual employee's performance may be less usual in the oriental culture because feedback is more likely to be oriented to the collective (the work group) than to individual employees (Su et al., 2019). Consequently, supervisor developmental feedback focusing on individual performance may have a greater influence on employees' intrinsic motivation and creative performance than might be the case in a Western organization. A Chinese organization, then, provides a meaningful context for examining the effects of developmental feedback.

According to cognitive evaluation theory, employees' perception of competence and autonomy are the two components of intrinsic motivation that can be increased by providing information (Deci & Ryan, 1985). More specifically, developmental feedback from supervisors that expresses the supervisor's concern for the employee's development and provides directions for development can elevate subordinates' intrinsic motivation by increasing their sense of competence and autonomy, which in turn can stimulate their creativity (Zhou, 1998, 2003). This may be especially the case for employees who have characteristics that are associated with creativity, such as self-confidence, determination, motivation to adopt new ideas, and willingness to take risks (Hempel, 2008; Guo et al., 2014; Zhang et al., 2017). Employees who are highly creative often have extensive interests, which can contribute to their discovering new approaches to solving problems and improving performance (Barron & Harrington, 1981). Besides, highly creative individuals are also more sensitive to development feedback and are more willing to accept the guidance provided in the development feedback. Hence, we predict that the relationship between developmental feedback and intrinsic motivation of highly creative individuals will be strong. In addition, individual creativity will strengthen the influence of developmental feedback on intrinsic motivation, which in turn will prompt highly creative performance.

## Figure 1

Conceptual model



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## **Developmental Feedback and Creative Performance**

Feedback is a powerful management tool and a common motivation strategy in organizations (Majumdar, 2015; Zhang et al., 2017). Developmental feedback is the extent to which supervisors offer their employees information about their performance, both on how they do their jobs and on the outcomes of their work, to enable them to learn and improve their performance in the future (Zhou, 2003). As such, previous studies have demonstrated that developmental feedback from supervisors could have positive influence on subordinates' behavior and performance (Guo et al., 2014). For instance, George and Zhou (2007) reported that the interaction of employees' mood and perceptions of developmental feedback from their supervisors would affect their creativity. And Li et al., (2011) study verified that supervisor developmental feedback could stimulate new employees' helping behavior and task performance. We suppose that when the employees perceive more developmental feedback from their supervisors, they are likely to be more creative in subsequent performance. This may be explained by how employees see themselves as a result of feedback and their perceptions about the source of feedback (their supervisor) and supervisors' desire to help them improve.

Cognitive evaluation theory predicts that when employees perceive themselves to be more competent and autonomous, they will be motivated to put more energy into their work and more likely to explore more effective and constructive ways of working (Zhou, 1998). Drawing on the cognitive evaluation theory, developmental feedback could improve employee's perception of their competence and autonomy i.e. of both psychological dimensions of intrinsic motivation (Deci & Ryan, 1985; Dweck, 1986). Developmental feedback, in essence, helps employees recognize their strengths and potential challenges at works (Florea et al., 2013), offers directions for learning and improvement (Li et al., 2011), and increases their perception of competence (Byron & Khazanchi, 2012). Unlike traditional performance feedback, which only focuses on how well employees have accomplished their tasks, developmental feedback can make the employees really interested in their work, encourage them to be more autonomous, and support them in seeking challenges that lead to creative solutions (Joo et al., 2015).

Developmental feedback delivers a message about the supervisor's concern for the employees' development, which frees employees to be open to new ideas and work methods (Zhou, 2003). This may explain why supervisor feedback has been verified to be positively correlated with their employees' creative performance (Hughes et al., 2018; Zhang et al., 2017). When employees receive information that is helpful and useful via developmental feedback, they will develop trust in their supervisor, feel good about their relationship with their supervisor (Zheng et al., 2014), recognize the support and concern from superiors and organization (Kuvaas, 2011), and be motivated to show higher creativity (Runco & Acar, 2012). Through developmental feedback, supervisors

can send signals to their employees that the organization is future-oriented and expects them to learn and improve their abilities, thereby expanding their range of work methods and applications (Li et al., 2011). This may eventually lead to more creative outcomes (Tierney & Farmer, 2011). In this context, employees will become more willing to take risks and deal with the uncertainty of new approaches and ideas (Kim & Beehr, 2017). *Hypothesis1: Developmental feedback will be positively related to creative performance.* 

## The Mediating Role of Intrinsic Motivation

Intrinsic motivation refers to the interest and desire the employees have in the work itself and the personal fulfillment they derive doing the work and learning in the process rather than the extrinsic rewards, financial and nonfinancial, that may accrue (Deci & Ryan, 1985; Cerasoli et al., 2014; Pinder, 2011). Intrinsic motivation is positively correlated with individual creativity (Prabhu et al., 2008; Grant & Berry, 2011; Chang & Teng, 2017). Potentially, supervisors can enhance employees' intrinsic motivation in several ways, thereby increasing their creativity (Wong & Pang, 2003). For example, Zhang and Bartol (2010) find that if supervisors give their employees more autonomy in making decisions and formulating working methods, it can effectively improve the intrinsic motivation of employees. Liu et al. (2018) verify that organizational support, including supervisor support, can increase their employees' intrinsic motivation and reduce their work-related fatigue.

We predict that developmental feedback from supervisors may increase the intrinsic motivation of employees and thus improve their creative performance. Drawing on the cognitive evaluation theory, supervisor feedback may affect employees' intrinsic motivation by acting on their perceptions of competence and autonomy (Spreitzer et al., 1997; Deci et al., 1999). Through developmental feedback, supervisors offer employees guidance and suggestions to promote their learning and professional growth over time. Moreover, employees who perceive developmental feedback from their supervisor, are more likely to believe in their supervisors and consider the relationships between them and their supervisors to be mutually respectful and satisfying (Norris-Watts & Levy, 2004). This can increase their sense of autonomy, reduce their concerns about taking risks, and promote their interest in the work itself. Employees will see themselves as more valuable and will be more motivated to go beyond expectations (Fuller et al., 2006). *Hypothesis 2: Intrinsic motivation will mediate the relationship between developmental feedback and creative performance*.

## The Moderating Role of Creative Personality

Creative personality refers to the personality characteristics associated with creative activities and achievements (Barron & Harrington, 1981). It has been found to be related to self-confidence, openness, and feeling capable

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(Gough, 1979; Tse et al., 2018). It is also related to measures of creative ability (Schoen et al., 2018), innovative behavior (Chau et al., 2018), creative outcomes (Zhou, 2003), and creative performance (Dul et al., 2011; Kim & Choi, 2017). Previous studies have theorized that creative personality moderates specific leadership behaviors. In several studies, employees who scored high on creative personality paid close attention to developmental feedback and were sensitive to supervisors' support for their development and motivation to be creative (Zhou & George, 2001; Zhou, 2003; Chau et al., 2018).

People who are high on creative personality describe themselves as inventive and confident rather than cautious and conservative (Amabile, 1983; Woodman et al., 1993; Zhou, 2003; Mai et al., 2015). These individuals approach problems in original ways, believe in their intuition, and tolerate inconsistency or ambiguity (Oldham & Cummings, 1996; Chau et al., 2018; von Stumm & Scott, 2019). Ilgen et al. (1979) noted early on that some employees are more sensitive to, and ready to internalize, feedback. For subordinates with highly creative personalities, developmental feedback should meet their needs for competence and autonomy and then promote their intrinsic motivation to improve their performance (Woolley & Fishbach, 2018). Here, we propose that employees who score higher on creative personality will be more disposed to respond positively to developmental feedback and will be more likely to promote their intrinsic motivation. Hypothesis 3: The dimension of Creative personality will moderate the relationship between developmental feedback and intrinsic motivation such that developmental feedback has a more positive effect on intrinsic motivation for individuals with high levels of creative personality.

Taken together, we expect that creative personality interacts with supervisor developmental feedback to influence intrinsic motivation, which in turn determines creative performance. That is, creative personality may conditionally influence the intensity of the indirect relationship between developmental feedback and creative performance through intrinsic motivation, thus demonstrating a moderated mediation effect between developmental feedback, intrinsic motivation and creative performance. The specific conceptual model is shown in Figure 1. We anticipate that the impact of developmental feedback on individual creative performance via intrinsic motivation will be more significant for those employees with high levels of creative personality. On the contrary, for employees who achieve low scores on creative personality, the effect of developmental feedback on intrinsic motivation and ultimately creative performance will be less significant. Hypothesis 4: The dimension of Creative personality will moderate the indirect relationship between developmental feedback and creative performance (via intrinsic motivation), such that developmental feedback has a more positive indirect effect on creative performance through intrinsic motivation for individuals with high scores of creative personality.

## Method

## **Participants and Procedure**

We collected survey data from a convenience pairing-sample of full-time employees and their respective supervisors in a large science and technology corporation located in Beijing, China. After receiving the executive manager's permission, the human resources manager assisted in randomly selecting employees (250) and their direct supervisors (50). Research assistants visited the departments to explain the study, distribute and collect questionnaires. The employees were required to complete questionnaires about their perception of developmental feedback from their direct supervisors, their own intrinsic motivation, and creative personality. The immediate supervisors were invited to rate the creative performance of each of their subordinates. We used pre-determined identification codes to match employee questionnaires with those of their supervisors. We also promised the confidentiality of their information and provided a small gift to every participant to increase response rate. After screening questionnaires for complete data, the final sample consisted of 215 usable dyads with performance ratings from 48 supervisors, for an overall response rate of 86%.

In the final sample, 46% of participating employees were female (99) and 58.3% of supervisors were male. Among the employees, 70.2% were under 30 years of age, and 95.4% were less than 40 years old. Most of the participating employees were well educated, 85.1% of them held a bachelor's degree or above. 41% of the participating employees had been working with the current supervisor for less than four years, and 87.4% had been with the current supervisor for less than six years.

## Measures

Employee surveys include measures of creative personality, intrinsic motivation, and developmental feedback from supervisors. The supervisor evaluated each employee's creative performance. All measurement items were originally developed in English, so we invited two bilingual (Chinese-English) scholars to translate all items into Chinese (Mandarin) and then re-translate them into English following the usual backtranslation program. All variables of this study were assessed on Likert-type scales ranging from 1 (strongly disagree) to 5 (strongly agree) unless otherwise specified.

### **Developmental Feedback**

We adopted the 3-item developmental feedback from supervisor scale developed by Zhou (2003). In order to further improve the accuracy of measurement, we modified the expression of items according to the language habits of Chinese employees. An example of items is "In daily work, my direct supervisor often gives me useful information to help me improve performance". The Cronbach  $\alpha$  in this study was .84.

### Intrinsic Motivation

Intrinsic motivation of employee was measured with Yoon and Choi's (2010) 6-item scale, which particularly emphasized individual intrinsic motivation to perform creatively. Sample items include, "I feel a sense of accomplishment when I try to find new solutions to complex problems" and "I feel a sense of satisfaction when I express myself creatively in my work". The Cronbach  $\alpha$  in this study was .86.

#### Creative Personality

We adopted the 30-item individual creative personality scale developed by Gough (1979). The scale included 18 adjectives that were positively correlated with individual creativity (e.g., clever, confident, inventive etc.) and 12 adjectives that were negatively

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correlated with individual creativity (e.g., cautious, conservative, honest etc). The Cronbach  $\alpha$  in this study was .91.

#### **Creative Performance**

Creative performance was rated by each employee's direct supervisor with Scott and Bruce's (1994) 4-item scale. As mentioned above, employees' creative performance is evaluated by their supervisors, which can effectively reduce the influence of potential common source bias. An example of items is "This employee often generates creative ideas in daily work." The Cronbach  $\alpha$  in this study was .93.

### **Control Variables**

Previous studies have found that the demographic characteristics of employee, such as Age, Gender, Education, and Working time with supervisor, are related to their creative activities at work (Carmeli & Schaubroeck, 2007; Zhao & Guo, 2018). Hence, we controlled these four variables in this study. Specifically, Gender of employee was coded as a dummy variable (1 = male, 2 = female). Education was divided into three levels (1 = associate degree and below, 2 = bachelor degree, 3 = master degree and above). Age was divided into five levels (1 = under 20, 2 = 21-30, 3 = 31-40, 4 = 41-50, 5 = over 51). Working time with supervisor was also divided into five levels (1 = 1 year or less, 2 = 1-3 years, 3 = 3-5 years, 4 = 5-8 years, 5 = 8 years and above).

### **Data Analysis**

In this study, analyses begun with a series of Confirmatory Factor Analysis (CFA) using Mplus7.2, Composite Reliability (CR) and Average Variance Extracted (AVE) using SPSS 22.0 to examine convergence and discriminant validity among the four core variables. Acceptable values of goodness of fit indices were  $\leq 3$  for  $\chi^2/df$ ,  $\geq .90$  for the Tucker-Lewis Index (TLI),  $\geq .90$  for the Comparative Fit Index (CFI),  $\leq .08$  for the Root Mean Square Error of Approximation (RMSEA),  $\leq .08$  for the Standardized Root Mean Square Residual (SRMR) (Sertbaş et al., 2020),  $\geq .70$  for CR values and  $\geq .50$  for AVE values (Hair et al., 2010; Cheung & Wang, 2017).

Then, we followed Cole et al. (2008) analytical procedures to examine the four hypotheses and the overall theoretical model by SPSS 22.0 through two steps. Step one was to verify the relationships between developmental feedback, intrinsic motivation and creative performance (Hypothesis 1 and Hypothesis 2) through hierarchical regression analysis. ThJ34e Sobel test was also used to further examine the mediating role of intrinsic motivation. Step two was to focus on the role of creative personality and check the whole moderated-mediation model (Hypothesis 3 and Hypothesis 4). The Bootstrap methods of the PROCESS macro designed by Preacher, Rucker and Hayes (2007) was used to test the moderating role of creative personality as well as the entire theoretical model.

## Results

## **Preliminary Analyses**

Before testing the hypotheses, we first examined the construct validity of the whole model using CFA (see Table 1). The results indicated that the four-factor model (with developmental feedback, intrinsic motivation, creative personality, and creative performance, see Model 4 in Table 1) yielded an acceptable fit to the data:  $\chi^2/df = 2.26 \le 3$ , TLI = .90  $\ge$  .90, CFI = .91  $\ge$  .90, RMSEA = .07  $\le$  .08, SRMR = .05  $\le$  .08, which is better than any other three alternative construct models. Then, we calculated Composite Reliability (CR) and Average Variance Extracted (AVE) to further test the measurement model. The results showed that the AVE values for four constructs were respectively .58, .54, .67, 65, all exceeding the required threshold values of .50. The CR values for four constructs were respectively .89, .80, .93, .94, which also all exceeded the required threshold values of .70. As such, these results supported the validity of our proposed four-factor model and showed that the final respondents could distinguish between these four constructs clearly.

Results of C	onfirmatory factor	r analysis (CFA)

Models	Factors	$\chi^2/df$	RMSEA	CFI	TLI	SRMR
Model 1	1 factor: $DF + IM + CP + CPer$	4.31	.11	.68	.66	.09
Model 2	2 factors: DF + IM + CP, CPer	3.01	.09	.79	.78	.08
Model 3	3 factors: DF + IM, CP, Cper	2.81	.08	.87	.86	.06
Model 4	4 factors: DF, IM, CP, CPer	2.26	.07	.91	.90	.05

*Note.* DF = developmental feedback; IM = intrinsic motivation; CP = creative personality; CPer = creative performance. Ideal model-fit indicators are:  $\chi^2/df < 3$ , RMSEA < .08, CFI > .9, TLI > .9, SRMR < .08.

## **Descriptive Statistics and Correlations**

The means, standard deviations, and correlations among demographics characteristics, developmental feedback, intrinsic motivation, creative personality and creative performance are presented in Table 2. Consistent with our arguments, developmental feedback is positively correlated with intrinsic motivation (r = .38, p < .01), and creative performance (r = .68, p < .01). Meanwhile, intrinsic motivation is positively correlated with creative performance (r = .41, p < .01). In addition, creative personality is positively correlated with intrinsic motivation, and creative performance (r = .68, p < .01 and r = .64, p < .01, respectively). Taken together, these results can provide preliminary support for our theoretical model.

Table	2
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Table 1

Results of descriptive analysis and correlations among main variables

Variables	Mean	SD	1	2	3	4	5	6	7
1. Gender	1.54	0.25	-						
2. Age	3.73	1.33	11	-					
3. Education	1.82	0.56	06	05	-				
4. Tenure	3.79	1.71	12	84**	06	-			
5. Developmental feedback	3.45	0.63	02	03	09	06	-		
6. Intrinsic motivation	3.73	0.53	12*	.29**	.02	23*	.38**	-	
7. Creative personality	3.62	0.54	05	05	11*	04	.58**	.35**	-

8. Creative performance 3.29 0.73 -.07 .05 -.04 .05 .68\*\* .41\*\* .64\*\* Note. \*p < .05; \*\*p < .01.

## **Tests of Hypothesizes**

The rationale behind Hypothesis1 and Hypothesis 2 suggest the indirect influence of developmental feedback from supervisor on subordinate's creative performance through intrinsic motivation. We therefore followed Preacher and Hayes' (2008) procedures to test the mediating model in SPSS 22.0. Specifically, at first, we regressed creative performance on developmental feedback, and then regressed intrinsic motivation on developmental feedback. In addition, we regressed creative performance on intrinsic motivation by controlling the influence of developmental feedback. Then, by controlling the role of intrinsic motivation, we further regressed creative performance on developmental feedback. At last, we used the Sobel test with Bootstrapping to examine the mediating role of intrinsic motivation. All results are reported in Table 3.

It can be seen from table 3 that developmental feedback was significantly related to creative performance (B = .67, SE = .06, t = 2.59, p < .01), thus supporting Hypothesis 1, which predicted a positive relationship between supervisor developmental feedback and employee creative performance. We then examined whether intrinsic motivation was the mediator between developmental feedback and creative performance to test Hypothesis 2. The results of the Sobel test showed that the indirect effect of supervisor developmental feedback on employee creative performance was also significant (Z = 2.72, SE = .03), and the bootstrapped 95% confidence interval [.01, .14] around the indirect influence did not contain "0", Hence, we can conclude that intrinsic motivation of employees can mediate the relationship between developmental feedback and creative performance, supporting Hypothesis 2.

#### Table 3

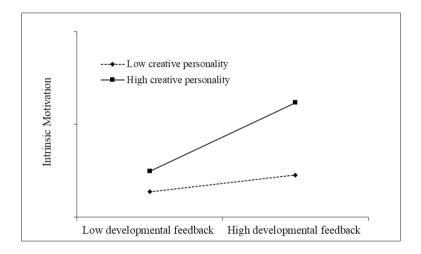
Results of mixed models for simple mediation

Variables	В	SE	t	p	LL95% CL to UL95%CL		
Direct and total effects							
Creative performance regressed on developmental feedback		.06	2.59	.00	[.56, .79]		
Intrinsic motivation regressed on developmental feedback		.07	3.03	.00	[.07, .33]		
Creative performance regressed on intrinsic motivation, controlling for developmental feedback		.07	3.52	.00	[.10, .36]		
Creative performance regressed on developmental feedback, controlling for intrinsic motivation		.06	3.73	.00	[.51, .75]		
Z		SE			LL95% CL, UL95%CL		
Bootstrap results for Sobel test							
Effect 2.72		.03			.01 .14		

*Note.* N = 215.

Bootstrap sample size = 5000. LL = lower limit; CI = confident interval; UL = upper limit.

Hypotheses 3 suggested that the dimension of creative personality of employees could moderate the association between developmental feedback and intrinsic motivation, such that the effect of developmental feedback from supervisor on intrinsic motivation would be more significant if subordinates have high scores on creative personality. Just as Table 4 shows, after controlling for four demographic variables, the interaction between supervisor developmental feedback and employee creative personality has a significant influence on employee intrinsic motivation ( $\beta = .23$ , SE = .06, t = 4.19, p < .01), supporting Hypothesis 3. Additionally, Figure 2 presents the interactive influence of developmental feedback and creative personality on intrinsic motivation.



### Figure 2

The moderating effect of creative personality on developmental feedback and intrinsic motivation

Hypotheses 4 suggested the moderating role of creative personality in the chain from development feedback to intrinsic motivation to creative performance. As shown in the bottom half of Table 4, if the employee has a low level of creative personality, the indirect influence of developmental feedback on creative performance via intrinsic motivation is not significant ( $\beta = .01$ , SE = .02, 95% CI [-.03, .06], contained zero). While, for the employee with a high level of creative personality, this indirect influence is significant ( $\beta = .08$ , SE = .03, 95% CI [.02, .16], not contained zero). That is to say, the employees, who have high levels of creative personality ( $\beta = .08$ , p < .01) would respond more positively to developmental feedback from their supervisors through raising their intrinsic motivation to promote more creative performance contrary to those employees with low levels of creative personality ( $\beta = .01$ , n.s.).In

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conclusion, we may reasonably conclude that creative personality can moderate the mediating role of intrinsic motivation between developmental feedback and creative performance, supporting Hypothesis 4.

Predictor	Estimate	SE	t	р	LL95% CL to UL95%CL		
	Intrinsic motivation						
Constant	4.23	.74	5.71	0.00	[2.77, 5.69]		
Gender	08	.08	90	0.37	[-0.24, 0.09]		
Age	.18	.07	2.65	0.01	[0.05, 0.31]		
Education	.06	.06	1.02	0.31	[-0.05, 0.17]		
Tenure	.01	.06	.17	0.87	[-0.11, 0.13]		
Developmental feedback	.63	.22	-2.89	0.00	[-1.07, -0.20]		
Creative personality	.55	.19	-2.83	0.01	[-0.93, -0.17]		
Interaction (developmental feedback × creative personality)	.23	.06	4.19	0.00	[0.12, 0.34]		
Parameter	Estimate	SE	t	р			
Residual	.67	.06	11.59	0.00	[0.56, 0.79]		
			Creative p	erformance			
Constant	2.54	.37	6.78	0.00	[1.80, 3.28]		
Gender	05	.08	61	0.53	[-0.02, 0.11]		
Age	04	.07	64	0.52	[-0.17, 0.09]		
Education	.02	.06	.32	0.75	[-0.09, 0.13]		
Tenure	.06	.06	.97	0.36	[-0.06, 0.18]		
Intrinsic motivation	0.19	0.07	3.03	0.00	[0.07, 0.33]		
Developmental feedback	0.6	0.06	11.59	0.00	[-0.56, 0.79]		
Parameter	Estimate	SE	t	р			
Residual	0.05	0.02	3.63	0.0	[0.01, 0.10]		
Creative personality							
Conditional indirect effect at creative personality = $M + 1$ SD	Estimate	SE	LL95% CI	UL95% CI			
-SD (-1)	.01	.02	03	.06			
+SD(+1)	.08	.03	.02	.16			

#### Table 4

Results of mixed models for moderation and moderated mediation

*Note.* Bootstrap sample size = 5000. LL = lower limit; CI = confident interval; UL = upper limit.

## Discussion

The relationship between supervisor feedback and employee creative performance has been widely investigated and garnered considerable empirical support (Zhou, 2003; Zhang et al., 2017). Nevertheless, the moderating and mediating mechanisms underlying this relationship remained largely unanswered. Our study showed that in a Chinese organization, developmental feedback was positively related to creative performance. And intrinsic motivation could mediate the relationship between developmental feedback and creative performance. Besides, the relationship between developmental feedback and intrinsic motivation was stronger for employees with high levels of creative personality. Meanwhile, for employees with highly creative personalities, the influence of developmental feedback on creative performance via intrinsic motivation was more significant, namely, creative personality can moderate the mediating role of intrinsic motivation between developmental feedback and creative performance.

## **Theoretical Implications**

The present study makes three theoretical contributions. Firstly, it explains how and when developmental feedback is likely to be associated with creative performance-via increasing individual intrinsic motivation, and especially for employees who are high in creative personality. As such, this further adds to the research literature on the value of developmental feedback (Zhou, 2003; Li et al., 2011; Zheng et al., 2015). The results support previous findings that individual intrinsic motivation may be a significant mediator of relationships among contextual factors, individual personality, creativity (Baas et al., 2008; Prabhu et al., 2008; Cerasoli et al., 2014; Hughes et al., 2018).

Secondly, it shows that creative personality is a boundary condition that strengthens the influences of developmental feedback on employee's intrinsic motivation. This is also a response to the calls for more research into the relationships between employee personality traits and creative performance (Shalley et al., 2009). Creative personality is likely to strengthen employees' sensitivity to developmental feedback, increasing their intrinsic motivation. Our results suggest that future research can consider creative personality as a moderator to explore the relationships between contextual characteristics (e.g., organization empowerment, extrinsic rewards, organizational support, supervisor feedback environment) and employee motivation and performance (Zhou, 2003; Zhang et al., 2017; Schoen et al., 2018; Hughes et al., 2018).

Thirdly, our study further contributes to the understanding of cognitive evaluation theory. Cognitive evaluation theory has indicated that dimensions of intrinsic motivation include competence and autonomy (Deci & Ryan, 1985) and that this may be why developmental feedback is related to intrinsic motivation as Zhou (2003) suggested. Previous studies have verified that individual intrinsic motivation and creative personality are related to their creative performance (Shalley et al., 2009; Byron & Khazanchi, 2012; Schoen et al., 2018). Therefore, we suggest future scholars take an active interest in the impact of developmental feedback on elements of intrinsic motivation and how these affect creative outcomes, especially for individuals who are open to new ideas and exploration (i.e., high in creative personality).

## **Practical Implications**

From a practical standpoint, our study indicates that developmental feedback from the supervisors can promote their employees' creative performance. This

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should inspire the leaders to use feedback to encourage employees' professional growth and thereby increase their creative output. Supervisors can encourage innovation by providing employees with developmental feedback regularly, for example, on a daily basis as part of a culture of feedback and development. Conveying support and encouragement for learning and applying new ideas to improve performance produces a climate that is conducive to creative activities and promotes innovation.

In addition, our results also suggest that individual motivation and personality are positively related to creative performance. Hence, if a supervisor would like to elevate the subordinates' creative performance, simply providing additional developmental feedback may not be enough. Managers can help their employees to cultivate high intrinsic motivation through developmental feedback. Meanwhile, they should take individual characteristics into consideration when recruiting, selecting and promoting employees, especially in those departments that need more creativity. Over time, an environment that supports elements that contribute to intrinsic motivation. This is another avenue for applied research – exploring ways in which developmental feedback can be structured to influence employees' enjoyment and fulfillment from their work, their openness to learning, and their inventing of new ways to improve performance.

Finally, given the Chinese context for this study, Chinese employees may be more willing to accept formal feedback from supervisors, and they are likely to pay attention not only to the reasons why supervisors provide feedback, but also to the details of the feedback process (Hempel, 2008; Huo & Von, 1995). Hence, in the process of giving feedback to subordinates, supervisors should take care of details, explain the reasons and convey more positive information to them so as to promote their trust in the supervisor and the organization and foster employees' intrinsic motivation. Chinese companies may be able to benefit especially from an emphasis on developmental feedback as a way to create an innovative organizational culture, and fundamentally improve the internal motivation of employees for innovation.

## **Limitations and Future Research Directions**

Although we collected performance data from a different source than perceptions of feedback, intrinsic motivation, and creative personality and analyses indicated that our results are reliable, the results may reflect the situation of young Chinese employees in a science and technology environment who have a habit of learning and development and are likely to be sensitive to, and appreciate, developmental feedback. Also, we conducted the study in China where supervisors are less likely to provide feedback than they do in Western cultures. However, supervisors in a science and technical corporate environment in China may be more likely to have a positive influence on their subordinates' creative performance than might be the case in other Chinese industries in which supervisors are less likely to provide any feedback, evaluative or developmental (Hempel, 2008). Future researchers could employ cross-national and crossorganizational samples and consider cultural diversity as the boundary condition to improve the generalizability of their own research results.

In addition, our study focused on the individual level of analysis. In practice, supervisors may simultaneously give developmental feedback to all subordinates in their unit (Joo et al., 2012). Further research could be carried out from the perspective of group level or cross-level to further expand the consequences of developmental feedback. Moreover, the data in our study were collected at one point in time and the self-report measures could be influenced by common method and consistency biases. Future research should collect data longitudinally to determine the extent to which developmental feedback affects later feelings of intrinsic motivation, which in turn will have a long-term effect on employee creative performance.

## Conclusions

Our study complements current research on the relationship between developmental feedback and creative performance. The conclusions of our study offer theoretical and practical insights into the mediating role of intrinsic motivation and the moderating role of creative personality affecting this confusing relationship. Our findings indicate that developmental feedback from supervisors is better able to promote creative performance by stimulating employees' intrinsic motivation. This is especially effective for employees with high (rather that low) levels of creative personality.

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## Povezanost između povratnih informacija o razvoju, intrinzičke motivacije, kreativne ličnosti i kreativnog postignuća

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Povratne informacije o razvoju mogu motivisati zaposlene da koriste prilike koje im se pružaju i budu kreativniji, naročito zaposlene koji povratne informacije (koje dobijaju od pretpostavljenih, prim. prev.) interpretiraju kao podršku za nove ideje. Polazeći od teorije kognitivne procene, ispitivali smo povezanost između povratnih informacija o razvoju (eng. developmental feedback), intrinzičke motivacije, kreativne ličnosti (svojstvo koje poseduju ljudi koji opisuju sebe kao inventivne i samouverene pre nego kao oprezne i konzervativne) i kreativnog postignuća. Pretpostavili smo da će povratne informacije o razvoju doprineti intrinzičkoj motivaciji zaposlenih i dodatno poboljšati njihovo kreativno postignuće, naročito kod osoba koje poseduju visoko izražena svojstva kreativne ličnosti. Uzorak je činilo 215 zaposlenih u Kini i njihovi direktni pretpostavljeni u okviru jedne velike naučne i tehnološke korporacije u Pekingu u Kini. Percepcija povratne informacije o razvoju koju su zaposleni dobijali od svojih pretpostavljenih je pozitivno povezana sa samoprocenom intrinzičke motivacije (koju su za sebe dali zaposleni, prim. prev.) i ocenama kreativnog postignuća (datog zaposlenog, prim. prev.) koje je dao pretpostavljeni. Takođe, intrinzička motivacija zaposlenih se pokazala medijatorom u odnosu između povratnih infromacija o razvoju i kreativnog postignuća. Ova veza je bila snažnija kod osoba koje se mogu opisati kao kreativne ličnosti (tj. koje su imali visoke skorove na skali kreativne ličnosti, prim. prev.).

*Ključne reči:* povratne informacije o razvoju, intrinzička motivacija, kreativna ličnost, kreativno postignuće, zaposleni u Kini

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