

Article

Why and When Supervisor Developmental Feedback Impact Innovative Behavior: Perspective of Self-Regulation Theory

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Abstract: In this study, we examined how supervisor developmental feedback influences employees' innovative behavior. A multi-time survey method was used in this study to collect data from 310 employees in Chinese enterprises. The research results show that supervisor developmental feedback has positive effects on employee innovative behavior via the mediating effect of self-goal-setting. We further found that uncertainty avoidance strengthens the positive relationship between supervisor developmental feedback and the self-goal-setting of employees. Our study offers a new account based on self-regulation perspective for understanding feedback.

Keywords: supervisor developmental feedback; self-goal-setting; innovative behavior; uncertainty avoidance



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1. Introduction

Innovative behavior, which is defined as “a behavior in which individuals produce creative ideas or countermeasures in their work and attempt to practise them” [1], is essential for organizations, especially in uncertain environments. COVID-19, which arose from SARS-CoV2, is an infection that affects the lower respiratory tracts [2]. On 30 January 2020, the World Health Organization declared COVID-19 an epidemic, and a public health emergency of international concern [2]. COVID-19, as an infectious disease, has a great impact on people's life and work, especially on employees and supervisors in the workplace [3]. In the face of today's rapidly changing environment, enterprises need innovation behavior in order to improve organizational performance and help organizations survive [4]. Research has shown that innovative behavior is linked to organizational performance [5], product innovation [6] and competitive advantage for the organization [7]. Given these positive effects, it is important to study the antecedents of innovative behavior. In the literature, multiple factors, such as personality traits [8], psychological traits [9], job characteristics [10], workplace friendship [11] and contextual factors have been identified as core to increasing employees' innovative behavior [12]. Scholars of management have begun to emphasize the importance of supervisors in influencing employees' innovative behavior, including entrepreneurial leadership [13] and spiritual leadership [14].

Meanwhile, the association between feedback, particularly supervisor developmental feedback, and employees' role attitude and behaviors, have been noticed by academia and enterprises over the past few years [15,16]. Communication between a supervisor and their employees has always been regarded as the key factor in employees' behavior, including innovative behavior [12,17]. Supervisor developmental feedback refers to the useful and valuable information that the supervisor relays to their employees in their work process, which assists the employee in learning and developing [18]. The present study focuses especially on innovative behavior, as it is recognized to involve more discretion than many other forms of employees' behavior and is important for the survival and

development of enterprises. Some perspectives are used to understand the association between supervisor developmental feedback and the innovative behavior of employees. Su et al. [19] followed a social cognition theory and reported that employees who are exposed to supervisor developmental feedback are likely to promote creative self-efficacy and reserve more attention for in-role behaviors, such as innovation. In addition, according to social exchange theory and the job demands–resources theory, Eva et al. [20] found that supervisor developmental feedback gives rise to experiences of innovative behavior.

Although the existing research on developmental feedback has made some achievements, they ignore the fact that supervisor developmental feedback can cause employees to regulate and control their own behavior according to discrepancies identified [21]. Bandura [21] suggested that individuals have intrinsic motivation and an ability to self-regulate, self-control and self-influence. Self-regulation stems from the motivation to influence the environment by reducing the gap between internal and external standards [21]. Supervisor developmental feedback can provide employees with useful information regarding their future development and work, as well as convey their concerns and expectations. Presently, it is easier for employees to recognize their existing problems and adjust their behaviors to reduce the gap between their current and future state [22]. However, the potential effects of supervisor developmental feedback on innovative behavior based on self-regulation theory have not been explored.

This research attempts to illuminate the association between supervisor developmental feedback and innovative behavior through a self-regulation perspective. We focus on the mediating role of self-goal-setting, which refers to individuals setting standards for themselves and regulating their behavior [23]. In the process of training employees, supervisor developmental feedback focuses on guiding employees to understand and evaluate their current and future development [18,24]. Under supervisor developmental feedback, employees tend to develop a stronger sense of self-determination and self-regulation; that is, they are more likely to set goals for themselves and regulate their behavior by comparing their self-goals with their degree of realization. Therefore, our study draws from self-regulation theory [25] and hypothesizes that supervisor developmental feedback is positively related to employees' innovative behavior through boosting their self-goal-setting.

In addition, we identify uncertainty avoidance (i.e., individuals' tolerance of threats in an uncertain environment [26]) as a key boundary condition that strengthens the relationship between supervisor developmental feedback and employees' innovative behavior. Employees with high levels of uncertainty avoidance cannot tolerate ambiguous events [27], are eager to establish a clear work plan for themselves (e.g., self-goal-setting) and potentially require more guidance from others (e.g., supervisor developmental feedback). Employees' individual characteristics can influence the effectiveness of supervisors' behavior. Therefore, by focusing on individuals' characteristics, this study tests the moderating effect of uncertainty avoidance. Namely, the positive effect of supervisor developmental feedback on self-goal-setting and subsequent innovative behaviors will increase for employees with high uncertainty avoidance.

Our research makes several significant contributions. First, this study offers a new perspective to understand the relationship between supervisor developmental feedback and employees' innovative behavior. Second, we discovered the underlying mechanism through which supervisor developmental feedback influences innovative behavior by examining the mediated role of self-goal-setting. This mechanism offers a specific perspective that can assist in developing the relationship in a supervisor–employee communication context. Last, by exploring how uncertainty avoidance moderates the relationship between supervisor developmental feedback and self-goal-setting, we found that uncertainty avoidance is an important context to consider as a boundary condition in the theory of supervisor developmental feedback.

In the following sections, we first examine the relationship between supervisor developmental feedback and innovative behavior through self-regulation theory. Second,

we investigate the relationship between supervisor developmental feedback and self-goal-setting and develop self-goal-setting as a mediator that links supervisor developmental feedback and innovative behavior. Third, we argue that the proposed consequence is stronger for employees with high levels of uncertainty avoidance. Fourth, we test the research model using data for 310 employees from Chinese enterprises. We conclude by describing the theoretical and practical contributions of our research to supervisor developmental feedback, self-regulation, innovative behavior and the related literature. The research model is depicted in Figure 1.

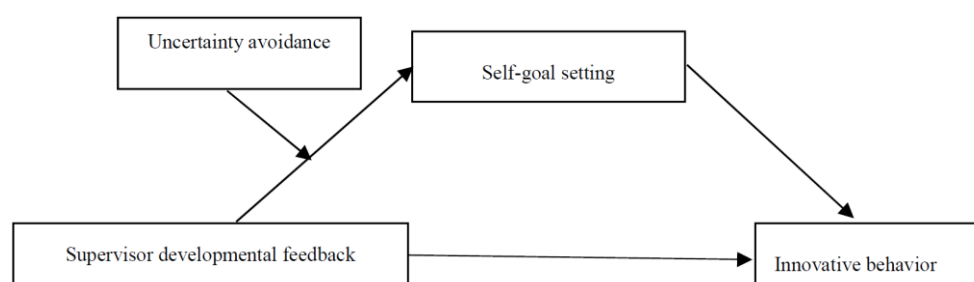


Figure 1. Research model.

2. Hypotheses

In our research, we adopt self-regulation theory [21,25,28] as the primary theoretical framework to examine how supervisor developmental feedback affects employees' innovative behavior through self-goal-setting. Bandura [28] suggested that the self-regulating system controls individual behavior.

Self-goal-setting is an essential part of self-regulation and refers to individuals setting standards for themselves and adjusting their behaviors accordingly [23]. Previous research has demonstrated that setting goals could be an explanatory mechanism between supervisor and followers' behavior [29] and work motivation [30]. Goal setting is part of an individual's cognitive process, which can be influenced by supervisor feedback [19]. Therefore, based on self-regulation theory, we position self-goal-setting as a critical mediator effect that explains employees' innovative behavior as a response to supervisor developmental feedback.

2.1. Supervisor Developmental Feedback and Innovative Behavior

Innovative behavior is primarily considered a motivational issue, which has led to researchers becoming interested in the methods of supervisors [31], such as entrepreneurial leadership [13] and spiritual leadership [14]. Supervisors' feedback to employees is an important communication method between supervisors and employees, and is of great significance to an organization [15]. Supervisors can considerably influence employee innovative behavior through motivation [32]. In particular, supervisors usually exert influence on employees by providing feedback on employees' motivation and proactively engaging in innovative activities [18,33]. In comparison with others in the organization, employees are more inclined to receive feedback from their supervisors and more willing to accept developmental feedback that promotes their development and work [34]. Developmental feedback focuses on the delivery of information related to task improvement, and is long-term-oriented to promote the growth and development of the recipient [18,35,36].

In this study, we draw on self-regulation theory to argue that supervisor developmental feedback can enhance employees' innovative behavior. First, self-regulation theory dictates that individuals can change their goals and motivations to achieve desired results after they receive relevant performance feedback [37]. Similarly, Bandura [25] argued that individual behavior is motivated and guided by expected goals and expected results, rather than being led by unrealized future states. When supervisors provide useful information for employee development or improvement, employees are more likely to realize the gap between their current and future status. By creating discrepancies between the present

and future, supervisor developmental feedback provides employees with a mechanism through which they can shape their cognition and behavior following their priorities.

Second, supervisor developmental feedback focuses on learning, development and improvement [18], which allows employees to give attention to strategies that can assist in improving their work [33]. New perspectives and knowledge from the supervisor assist employees in thinking positively and inspire them to produce creative ideas. Therefore, employees are more likely to learn, apply innovative skills and strategies, and actively generate creative ideas to solve problems.

Third, developmental feedback from a supervisor is a kind, caring and safe signal for employees [18]. This generation of innovative behavior requires active thinking by individuals and risks often accompany it. Employees are more willing to perform risk-taking innovative behaviors when they feel cared for by supervisors and have a sense of security. Therefore, our first hypothesis is:

Hypothesis 1. *Supervisor developmental feedback has a positive relationship with employees' innovative behavior.*

2.2. Supervisor Developmental Feedback and Self-Goal-Setting

Further, we draw from self-regulation theory to uncover the mechanism of self-goal-setting as a mediator through which supervisor development feedback predicts employees' enhanced innovative behavior. Self-goal-setting refers to individuals setting standards for themselves and regulating their behavior [23]. Self-regulation includes three processes: self-observation, self-judgement and self-reaction. Self-judgement refers to an individual setting a personal goal and eliciting a positive or negative self-evaluation according to the standard, and the aim is to establish a self-standard system [38]. Consistent with self-regulation theory [28], individuals will establish internal standards for their behavior based on their observations and cognitions of their situation. Next, individuals compare internal standards with external standards to induce positive or negative self-evaluations, thereby regulating and controlling their behavior. Under the feedback of supervisors, employees tend to develop a stronger sense of self-determination and self-regulation; that is, employees are more likely to set goals for themselves and adjust their behavior through comparing their self-goals and achievement levels. Therefore, self-goal-setting is an important aspect of self-regulation.

Previous research has suggested that supervisors' behaviors can influence individual goal-orientation behavior [39]. Similarly, we infer that supervisor developmental feedback can enhance employee self-goal-setting. The information provided by supervisor developmental feedback is not only helpful to employees' development, but also has future orientation [18]. After receiving future-oriented information, employees are more likely to conduct self-assessment to compare their current and future statuses. Subsequently, employees may think deeply about how to reduce this gap between their current and future statuses, and set goals in order to realize the future-oriented and idealized working state. Therefore, employees who tend to be motivated by positive interactions with their supervisors are likely to engage in self-goal-setting.

Meanwhile, self-goal-setting leads to greater levels of innovative behavior in employees. Following self-regulation theory, goal-oriented individuals pay more attention to learning and focus on improving personal abilities. These individuals tend to spend their time and energy on tasks, persist through obstacles and failures, and seek more effective learning strategies [40,41]. In other words, individuals who are good at goal setting can set goals more effectively, and can persist and find effective strategies in the face of failure. Because they are not afraid of failure, dare to take risks and challenges, and see challenging work as an opportunity to learn new things, they will actively propose new ideas and put them into practice [42]. Therefore, based on the above elaborations, we propose our second hypothesis:

Hypothesis 2. *Self-goal-setting mediates the positive relationship between supervisor developmental feedback and employees' innovative behavior.*

2.3. The Moderating Effect of Uncertainty Avoidance

Dorfman and Howell [43] theorized uncertainty avoidance, which refers to the degree to which individuals feel uncomfortable in ambiguous situations; that is, their tolerance for threats in an uncertain environment. Uncertainty avoidance exists not only at the organizational level, but also at the individual level. An individual with a higher level of uncertainty avoidance is more likely to feel nervous and anxious in uncertain and unpredictable situations and might try to avoid this uncertainty [27]. Individuals with a high degree of uncertainty avoidance have a low tolerance for uncertain matters; individuals with a low degree of uncertainty avoidance tend to remain calm and can tolerate uncertain environments. We propose that the theory-based boundary condition of uncertainty avoidance will strengthen the positive effect of supervisor developmental feedback on self-goal-setting.

Supervisor developmental feedback and high uncertainty avoidance can provide employees with developmental and useful information, and convey supervisors' expectations. Employees with a high level of uncertainty avoidance who face an obvious system requirement or set of feedback feel more stable and comfortable than anxious [44]. Supervisor developmental feedback regards information that could assist in improving the current status of employees, so that employees can clarify the direction of their future efforts and clearly understand future developments and behaviors [18,33]. For employees with high uncertainty avoidance, this feedback will increase their reliance on established rules.

Conversely, employees with low uncertainty avoidance are more inclined to choose unstructured situations [45]. Extra support (e.g., feedback) and supervisor developmental feedback might not encourage their development, which indicates that curiosity for new things will not be induced. Therefore, it is challenging for these employees to gain a sense of accomplishment in their restricted daily work. These employees find supervisors less amiable and beneficial, and do not value the active interaction and communication between supervisors and employees. Consequently, supervisor developmental feedback minimally affects their self-goal-setting. Therefore, we propose the third hypothesis:

Hypothesis 3. *Uncertainty avoidance moderates the relationship between supervisor developmental feedback and self-goal-setting. Specifically, a positive relationship is stronger when employees have higher uncertainty avoidance.*

In general, we propose that supervisor developmental feedback will influence employees' self-regulation at work and increase their self-goal-setting, which would enhance the employees' level of innovative behavior. We suggest that this regulation is more prominent for those with higher uncertainty avoidance. We propose the fourth hypothesis:

Hypothesis 4. *Uncertainty avoidance moderates the indirect effect of supervisor developmental feedback on innovative behavior through self-goal-setting. Specifically, the mediation effect is stronger when employees have higher uncertainty avoidance.*

3. Method

3.1. Participants and Procedure

The hypotheses in this study were tested using data collected from high-tech enterprises in North China. These high-tech enterprises are from different locations (including Harbin, Shenyang and Changchun), involving information, internet, finance and other industries. We conducted a pre-survey with 10 employees to evaluate the usability of the preliminary tools in this study. Based on the results and suggestions of the pre-survey, the wording was slightly modified for the purpose of ensuring that employees understand the instructions clearly. Then, the questionnaire was distributed. Employees and their

superiors were informed of the purpose of the research and its potential impact. The confidentiality of the data was clearly guaranteed for them. We told them that no one in their company will see the answers they fill in, and asked them to complete the questionnaires truthfully. Data were collected from full-time employees through a wide range of online methods (i.e., sending emails or forwarding links to online questionnaires). A time-lagged study with two measurement waves was conducted. Employees completed the first questionnaire online at the start of June 2020. In the first wave, employees provided data on supervisor developmental feedback, self-goal-setting, uncertainty avoidance and demographics. In the second wave (two weeks after the first wave), each employee's supervisor rated the employee's innovative behavior. Supervisors and employees were informed that the aim of the investigation was to improve human resource practices, and the researchers assured them that their answers were confidential. We initially distributed the questionnaire to 450 employees and 352 questionnaires were returned. After the second wave, data with missing values and mismatches between the two waves were discarded. In total, 310 valid questionnaires were received (response rate: 68.89%).

The sample included 160 men and 150 women, and of the 310 employees, 51.60% were men, and 48.40% were women. The average age of employees in this study was 30.21 years old ($SD = 6.80$; the age ranges from 17 to 57). In terms of education of the sample, 11.00% employees had finished a junior college degree or below, 59.00% employees held a bachelor's degree, 26.10% employees held a master's degree, and 3.9% held a doctoral degree or higher (Appendix A).

3.2. Measurements

All variables in this study were measured using scales derived from the existing literature. We adopted a translation-back-translation procedure to ensure the accuracy of the questionnaire in this study. Two bilingual Ph.D. candidates were selected to translate the original version of the questionnaire into Chinese, then another professor and two Ph.D. candidates translated the Chinese version into English. We asked 10 employees from several companies to complete a pre-survey in order to make sure of the accurate expression of the items. Then, we established the scales, which included supervisor developmental feedback, self-goal-setting, uncertainty avoidance, innovative behavior and the control variables. The measures in this study used 5-point response scale, which ranged from 1 (strongly disagree) to 5 (strongly agree).

Supervisor developmental feedback. This variable was assessed using Zhou's 3-item scale [18]. A sample item is: "My immediate supervisor often gives me developmental feedback". The Cronbach's alpha in this study was 0.78.

Self-goal-setting. We measured self-goal-setting based on the 5-item scale developed by Neubert and Wu [23]. A sample item is: "I consciously have goals in mind for my work efforts". The Cronbach's alpha in this study was 0.83.

Innovative behavior. A 6-item scale developed by Scott and Bruce was used to investigate employees' innovative behavior [1]. A sample item is: "This employee searches out new technologies, processes, techniques, and/or ideas". Each employees' supervisors rated the employees' innovative behavior. The Cronbach's alpha in this study was 0.87.

Uncertainty avoidance. A 5-item scale developed by Dorfman and Howell was used, which assessed uncertainty avoidance [43]. Existing studies provide evidence that these three variables can be used to measure the uncertainty avoidance of employees [46]. A sample item is: "Rules and regulations are important because they inform employees what the organization expects of them." The Cronbach's alpha in this study was 0.84.

Control variables. Drawing on previous research, employees' age, gender, and education were controlled because these demographic characteristics may have an influence on employee behavior [18,36,47]. Education was coded as "1" for employees who held a junior college degree or below, "2" for employees who held a bachelor's degree, "3" for employees who held a master's degree, and "4" for employees who held a doctoral degree or higher. We did not take supervisor demographics as control variables, similarly

to the previous research, and we also examined the influence of leadership on innovative behavior [47].

4. Results

4.1. Confirmatory Factor Analyses

Mplus 7.0 and SPSS 26.0 were used for statistical analysis. Confirmatory factor analysis (CFA) was conducted on the text to determine the validity of measures via Mplus 7.0. The results of the statistical analysis are shown in Table 1, demonstrating the acceptable fit of the hypothesized model (consisting of supervisor developmental feedbacks, self-goal-setting, innovative behavior, and uncertainty avoidance; CFI = 0.96, TLI = 0.95, RMSEA = 0.07, SRMR = 0.04, $\chi^2 = 128.65$, $df = 48$). Consequently, we tested the hypotheses in this study using the four-factor solution.

Table 1. Results of confirmatory factor analysis.

	χ^2	df	CFI	TLI	RMSEA	SRMR
Four-factor model: SDF, SGS, UA, IB	128.65	48	0.96	0.95	0.07	0.04
Three-factor model: SDF, SGS + UA, IB	524.36	51	0.77	0.70	0.17	0.13
Two-factor model: SDF + SGS + UA, IB	559.59	53	0.75	0.69	0.18	0.12
One-factor model: SDF + SGS + UA + IB	800.55	54	0.63	0.54	0.21	0.14

Note: 1. SDF = supervisor developmental feedback; SGS = self-goal-setting; UA = uncertainty avoidance; IB = innovative behavior.

4.2. Hypotheses Tests

As per the results of the descriptive statistics of variables shown in Table 2, supervisor developmental feedback is positively associated with self-goal-setting ($r = 0.70$, $p < 0.01$) and innovative behavior ($r = 0.51$, $p < 0.01$); self-goal-setting is positively associated with innovative behavior ($r = 0.63$, $p < 0.01$). The above results offer preliminary proof to support our hypothesis.

Table 2. Descriptive statistics, correlations of variables.

Variables	Mean	SD	1	2	3	4	5	6
1. Gender ^a	1.48	0.5						
2. Education ^b	2.23	6.89	−0.08					
3. Age	30.27	6.7	0.04	−0.05				
4. Supervisor developmental feedback	3.4	0.9	−0.06	0.01	0.17 **			
5. Self-goal-setting	3.8	0.7	−0.1	0.07	0.19 **	0.70 **		
6. Uncertainty avoidance	3.95	0.71	−0.02	0.04	0.07	−0.04	0.03	
7. Innovative behavior	3.81	0.76	−0.19 **	0.1	0.23 **	0.51 **	0.63 **	0.03

Note: $n = 310$. a. Gender: 1 = Male; 2 = Female. b. Education: 1 = junior college degree or below; 2 = bachelor degree; 3 = master's degree and 4 = doctoral degree or higher. ** $p < 0.01$.

In order to test hypotheses 1 to 3, hierarchical regression analysis was used to perform data analysis. Two parts were estimated by us. Moderating effects were considered in the first part. Mediating effects are accounted in the second part. Table 3 displays the multiple regression analysis results. Hypothesis 1, which predicted a positive relationship between supervisor developmental feedbacks and self-goal-setting, was supported ($\beta = 0.53$, $p < 0.001$).

Hypothesis 2, which predicted that self-goal-setting would mediate the relationship between supervisor developmental feedbacks and innovative behavior, was also supported. There was a positive relationship between self-goal-setting and innovative behavior ($\beta = 0.52$, $p < 0.001$). Supervisor developmental feedback has a positive effect on innovative behavior ($\beta = 0.40$, $p < 0.001$). The relationship between supervisor developmental feedbacks and innovative behavior was still significant when self-goal-setting was included in the regression model ($\beta = 0.12$, $p < 0.005$), but the effect became weaker. We

also estimated the indirect effects and their 95% confidence intervals. The results show that self-goal-setting had significant mediating effects on the link between supervisor developmental feedback and innovative behavior (*indirect effect* = 0.280, *S. E.* = 0.046, 95% *C.I.* = 0.193 to 0.372). Overall, hypothesis 2 is supported.

Table 3. Summary of multiple regression analysis results.

	Self-Goal-Setting			Innovative Behavior		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Control variables						
Gender ^a	−0.15	−0.09	−0.08	−0.29 **	−0.24 **	−0.20 **
Education ^b	0.08	0.06	0.07	0.1	0.09	0.06
Age	0.02 ***	0.01 *	0.01	0.03 ***	0.02 **	0.01 **
Independent variable						
Supervisor developmental feedback		0.53 ***	0.55 ***		0.40 ***	0.12 *
Moderator						
Uncertainty avoidance			0.05			
Interaction						
Supervisor developmental feedbacks * Uncertainty avoidance			0.09 **			
Mediator						
Self-goal-setting						0.52 ***
R ²	0.05	0.51	0.52	0.1	0.31	0.43
adjusted-R ²	0.04	0.5	0.51	0.09	0.31	0.42
ΔF-statistic	5.79 **	280.42 ***	8.31 **	11.24 **	95.74 ***	62.19 ***
ΔR ²		0.45 ***	0.01 **		0.22 ***	0.12 ***

Note: *n* = 310. a. Gender: 1 = Male; 2 = Female. b. Education: 1 = junior college degree or below; 2 = bachelor degree, 3 = master's degree and 4 = doctoral degree or higher. * *p* < 0.05, ** *p* < 0.01, *** *p* < 0.001.

Then, we tested the moderating effect of uncertainty avoidance. As show in Model 1 of Table 3, control variables including gender, education and age were added into the regression equation. Then, the independent variable (supervisor developmental feedbacks) was added into the regression equation. We then added uncertainty avoidance and the interaction of supervisor developmental feedback with uncertainty avoidance together into the regression. The interaction of supervisor developmental feedback and uncertainty avoidance was positively and significantly related to self-goal-setting ($\beta = 0.09$, $p < 0.01$).

The interaction plot is presented in Figure 2. The plot shows that supervisor developmental feedback had a positive association with self-goal-setting when uncertainty avoidance was high (*simple slope* = 0.38, $t = 6.94$, $p < 0.001$), but this association was not significant when uncertainty avoidance was low (*simple slope* = 0.14, $t = 1.67$, n.s.). Hence, hypothesis 3 is supported.

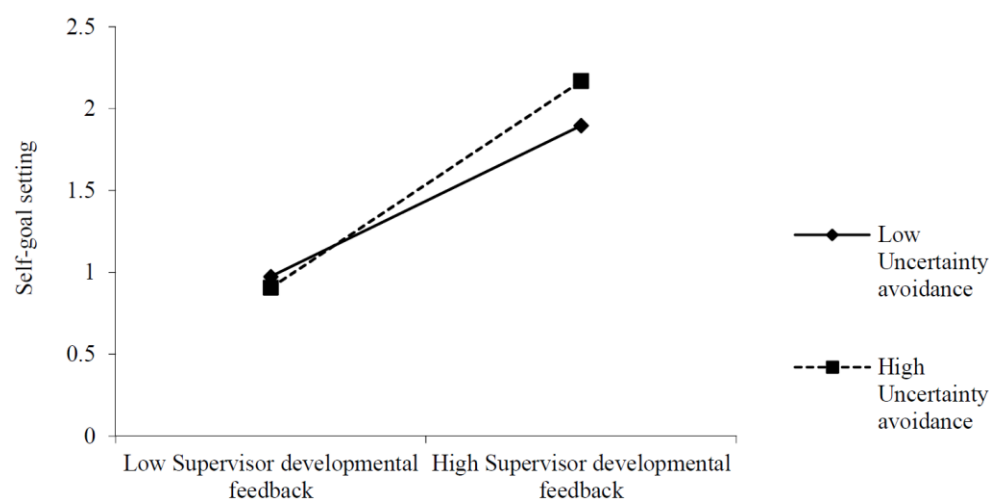


Figure 2. The moderating effect of uncertainty avoidance on the relationship between supervisor developmental feedback and self-goal-setting.

The indirect effect of supervisor developmental feedback on innovative behavior through self-goal-setting was stronger when uncertainty avoidance was high (*conditional indirect effect* = 0.346, *S. E.* = 0.056, 95% *C.I.* = 0.239 to 0.459) than when uncertainty avoidance was low (*conditional indirect effect* = 0.234, *S. E.* = 0.048, 95% *C.I.* = 0.147 to 0.335), supporting hypothesis 4. We also examined alternative moderated-mediation models, and found that uncertainty avoidance did not moderate the effect of self-goal-setting on innovative behavior.

5. Discussion

COVID-19, which has gradually spread across the world since 2019, is presenting us with “uncertain times”, and is having a significant impact on people in the workplace [48]. Faced with COVID-19 and other crises with environmental uncertainty, enterprises need to be prepared to strengthen the management of employees. This study explores the positive effect of supervisor developmental feedback on employees’ innovative behavior, as well as the relationship’s mediating effect on self-goal-setting and moderating effect on uncertainty avoidance. The study results support using a self-regulation perspective to understand the association between supervisor developmental feedback and innovative behavior. This study found that being exposed to supervisor developmental feedback can improve employees’ self-goal-setting and thus enhance innovative behavior. In addition, the results reveal that the presence of high uncertainty avoidance magnified the benign effect of supervisor developmental feedback on employees’ self-goal-setting and innovative behavior. These findings contribute to the existing management literature in several ways.

5.1. Theoretical Implications

This study has three significant theoretical contributions. First, we contribute to the research of supervisor developmental feedback by using a self-regulation approach to study input concerning employees’ innovative behavior. Previous research has suggested that supervisors’ characteristics or behaviors can influence employees’ innovative behaviors from different perspectives, including intrinsic motivation [49], leader–member exchange theory [50], social information processing [51] and social identity theory [52].

Our studies contribute to the supervisor developmental feedback literature by offering an additional account to understand the relationship between supervisor developmental feedback and employees’ innovative behavior. This extension is meaningful because it suggests that supervisor developmental feedback, which provides employees with useful information regarding future orientation [18], allows employees to be aware of the gap between their current and future orientation. In addition, it can inform their perception of resources and thus change attitudes and behaviors. Previous studies have linked employees’ perceptions of supervisor developmental feedback to their creativity [18] and innovative behavior [19]. However, the link between supervisor developmental feedback and innovative behavior, as well as the underlying mediating effect of self-goal-setting, has not been established. The self-regulation perspective widens the scope of explanations regarding the effect of supervisor developmental feedback. It offers a different perspective framework to conceptualize innovative behavior in supervisor developmental feedback research.

Second, by examining the mediated role of self-goal-setting, we discovered the underlying mechanism through which supervisor developmental feedback influences innovative behavior. Consistent with self-regulation theory [53], feedback assists individuals in identifying the difference between their current state and the desired future [18], and in transforming these realizations into direct work-related goals that remain based on the individual’s mental model [54]. Su et al. [19] emphasized the importance of future research that examines the potential effect of supervisor developmental feedback on employees’ innovative behavior. The study results are enriched by the informational and future-oriented nature of supervisor developmental feedback [18,55]. These findings provide insight regarding how supervisor developmental feedback facilitates employees’ self-regulation, and

may subsequently transform future-focused conceptualizations of feedback into locally focused work states (i.e., self-goal-setting and innovative behavior). To some extent, the result of this research also responds to the call of Eva et al. [20] and explains how feedback from supervisors motivates employee innovative behavior.

Third, our findings regarding the moderating role of uncertainty avoidance strengthen the relationship between supervisor developmental feedback and innovative behavior. This study found that those with high uncertainty avoidance are more likely to increase their self-goal-setting and perform innovative behavior after receiving supervisor developmental feedback. This result is consistent with Watts et al. [56], who suggests that uncertainty avoidance moderates transformational leadership and innovation. These findings give a deeper understanding of how avoiding uncertainty affects the process of employees' innovative behaviors. The result of this research also responds to the call to explore internal conditions to enhance the relationship between feedback from supervisors and employees' innovative behavior [36].

5.2. Practical Implications

Our findings have several implications. First, when considering the positive effect of supervisor developmental feedback on innovative behavior, supervisors should implement developmental feedback when communicating with team members and provide high-quality, detailed feedback related to specific behaviors.

Second, this study provides evidence that employees' self-goal-setting is substantially related to innovative behavior and can mediate between supervisor developmental feedback and innovative behavior. When supervisors adopt effective feedback strategies to stimulate employees' innovative behaviors, they should assist employees in discovering their future development needs and encourage employees to set personal goals and formulate reasonable action plans. Previous studies have demonstrated that employees' work performance will be influenced by goal setting [57]. Once the employees' self-goal-setting increases, supervisors would be more likely to interact with them actively and assist them in improving innovative behavior. Therefore, supervisors can strengthen their benign interaction with employees and provide them with useful feedback, which would enable employees to understand their personal future development and set goals to improve their innovative behavior. Through the abovementioned measures, managers can successfully create a diverse, harmonious and dynamic creative work environment.

Third, because uncertainty avoidance strengthens the relationship between supervisor feedback and self-goal-setting, supervisors can adopt a variety of management methods according to each individual's characteristics. Employees with high uncertainty avoidance prefer to work according to the supervisor's established instructions and tend to seek feedback from others. Therefore, supervisors must pay attention to the personality of employees, particularly in terms of their uncertainty avoidance.

6. Limitations and Future Research

There are several limitations to the current research. First, the cross-sectional data were obtained through a questionnaire survey. This method cannot reflect the vertical causality between variables, and thus longitudinal research is required in the future. Future research might use longitudinal designs, in which measures of supervisor developmental feedback, self-goal-setting, uncertainty avoidances and innovative behavior are collected over several periods to permit an examination of the causal relationships.

Second, although the study sample involves multiple industries and various types of employees, the sample size is small. The sample size should be further expanded in future research. This study included samples from Northeast China and has certain cultural limitations; therefore, further research should consider other specific cultures.

Third, we constructed the theoretical model based on the self-regulation perspective to explore the effects of supervisor developmental feedback and employees' behavior outcomes. Nevertheless, we tested the mediating role of self-goal-setting regarding supervisor

developmental feedback. In the future, more studies are encouraged to test whether supervisor developmental feedback might affect employees' innovative behavior via employee cognitive and behavioral pathways [16].

Further to the moderating effect of uncertainty avoidance, other contingent variables (e.g., self-regulatory strategies) could be considered in the future. Regulatory focuses can affect individuals' perception of the external environment, which can influence behavior [58]. Individuals could pursue two kinds of regulatory goals: promotion and prevention [58]. Specifically, individuals who are high on the employment ladder are potentially more likely to engage with extra role behaviors when they get feedback from supervisors, because they focus on achieving their goals through acting. Conversely, individuals high in prevention focus might prefer to conserve their resources to avoid the risk. Future studies should consider several perspectives or theories to explain the boundary conditions of the relationship between supervisor developmental feedback and employees' innovative behavior.

7. Conclusions

In response to recent calls for research on the feedback of supervisors [56,58], we used self-regulation theory to explore the relationship between supervisor developmental feedback and employees' innovative behavior. The results demonstrate that employees' cognition and behaviors are positively affected by supervisor developmental feedback; specifically, through an increase in employees' self-goal-setting and subsequent innovative behavior. In addition, our results show that uncertainty avoidance can increase the positive effect of supervisor developmental feedback on employees' self-goal-setting. Consequently, this study contributes to the understanding of how and why supervisor developmental feedback influences employees' innovative behavior from a self-regulation perspective. This study serves as a foundation for understanding the possible contributions of supervisor developmental feedback. In the future, scholars can continue to enrich the understanding of the effects, mechanisms, and contingency of this structure in through research.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data are available from authors upon request.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A. Basic Employees' Information and Measurement Items

Table A1. Basic employees' information.

Variables and Items
1. Gender (1 = male; 2 = female)
2. Education (1 = junior college degree or below; 2 = bachelor degree; 3 = master's degree and 4 = doctoral degree or higher.)
3. Age (in years)

Table A2. Measurement items.

Variables and Items
Supervisor developmental feedback
1. My immediate supervisor often gives me developmental feedback.
2. While giving me feedback, my supervisor focuses on helping me to learn and improve.
3. My supervisor provides me with useful information on how to improve my job performance.
Self-goal-setting
1. I establish specific goals for my own performance.
2. I consciously have goals in mind for my work efforts.
3. I work toward specific goals I have set for myself.
4. I think about the goals that I intend to achieve in the future.
5. I write specific goals for my own performance.
Uncertainty avoidance
1. Rules and regulations are important because they inform employees what the organization expects of them.
2. It is important to have job requirements and instructions spelled out in detail so that employees always know what they are expected to do.
3. Managers expect workers to closely follow instructions and procedures.
4. Standard operating procedures are helpful to employees on the job.
5. Instructions for operations are important for employees on the job.
Employee innovative behavior
1. This employee can come up with creative idea at work.
2. This employee can search out new technologies, processes, techniques, and/or product ideas.
3. This employee can promote and champion his/her ideas to others.
4. This employee can investigate and secure funds needed to implement his/her new ideas.
5. This employee can develop adequate plans and schedules for the implementation of his/her new ideas.
6. In general, this employee is innovative.

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