

## Article

# Future Work Self and Employee Creativity: The Mediating Role of Informal Field-Based Learning for High Innovation Performance

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**Abstract:** In today's highly uncertain environment, the value of creativity and innovation are increasingly critical. How individuals could improve their creativity and innovation performance has become the focus of attention. Future work self as an intrinsic motivation factor plays an important role in creativity and innovation. Based on the self-consistency theory, this study integrated proactive personality and informal field-based learning (IFBL) to explore the relationship between future work self and employee creativity to increase innovation performance. It used data from 201 R&D department employees in China's high-tech companies. The results show that future work self has a positive effect on employee creativity and that IFBL mediates the relationship between future work self and employee creativity. This process is then positively moderated by a proactive personality. This study's results help clarify the formation mechanism of creativity from the perspective of intrinsic motivation and indicate that future work self can drive individuals' creativity and innovation efforts, especially under the consistency of self-concept, motivation and personality. This research also emphasizes the importance of IFBL in improving individual creativity and further organizational innovation performance. Implications for theory and management to help improve creativity and innovation performance are then discussed in detail.

**Keywords:** future work self; employee creativity; informal field-based learning; innovation; proactive personality



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## 1. Introduction

Employee creativity, defined as the generation of novel and useful ideas, is a key to the improvement of organizational innovation, and it is crucial to the organizations' sustainability and competitiveness in uncertain and dynamic environments [1–6]. As a result, organization managers and researchers are increasingly focusing on employee creativity to identify what factors can help improve employee creativity and further innovation performance [7–10].

Creativity is the premise and foundation of innovation. Innovation is the implementation and application of creativity [11]. The subject of enterprise innovation is employee, the quality of innovation performance depends on employee creativity, and it is thus vital to explore employee creativity in order to better understand the critical role of employee creativity in facilitating innovation performance in an organizational context [12].

There are two main points of view in researching the encouraging factors of employee creativity behavior. On the one hand, researchers believed that employee creativity is ultimately offered up by individuals [13]. Such as personality, emotional intelligence, psychological capital, psychological safety, individuals' knowledge and skills [14–17]. On the other hand, related research suggests that employee creativity is generated by external

factors, such as family motivation, management characteristics, constructive leadership, team goal orientation, high-performance work system and organizational climate [18–27]. In recent years, scholars have begun to pay attention to the impact of new features of the digital era such as social media, information conflict and cooperation models on employee creativity [28–30].

In fact, individual creativity is directly enacted by intrinsic motivation [31]. Among the antecedent factors of employee creativity at the individual level, considerable evidence indicates that employee creativity as the essential factor for high innovation performance flourishes along with cognitive process, psychological state, individual emotion and behavior [32,33]. These studies have indicated that self-concept is a crucial mechanism underpinning the tie between these factors and employee creativity. When self-concept is clear and robust, individuality and independent thinking will increase, which promotes creativity and innovation [34]. Simultaneously, researchers also notice the dark side of creativity, linking creativity with dishonesty, behavioral deviations and unnecessary risk-taking [35–38]. The main reason for these negative behaviors in creativity is that individuals may have a deviation in creativity and lack a long-term plan for their future selves. Future work self as the future orientation of the self-concept provides an essential connection between future direction and long-term plan, can shape a clear creative direction and implementation path to ensure the realization of the value of creativity and is a significant influence on the management of creativity and further innovation performance [39]. However, existing literature seldom explores the role of future work self in employee creativity and innovation management.

Strauss et al. defined future work self as a representation of the future self-concept that encapsulates individual aspirations and meaning expectations in the workplace [39]. Everyone can describe the possible self in the future but differs in clarity and difficulty. Salient future work self reflects the clarity and difficulty of the individual's future self-imagination and is a critical motivation for proactive behavior. Therefore, this study focused on the salience of future work self [40–42]. Salient future work self brings concrete goals to individual employees, provides a “compass” for employee's creativity and draws a feasible path by inspiring internal motivation to take proactive behaviors that may increase employee creativity, which will help improve innovation. Highly salient future work self can motivate an individual with future goals to dynamically modify the current self-concept and to strive to eliminate the gap between future self and current self—a discrepancy-reduction process. Thus, we expect that future work self can drive an individual to reduce the discrepancy to achieve self-concept consistency and promote employee creativity in the long run.

Previous research is mostly based on the cognitive evaluation mechanism to reveal future work self's effect on performance, such as self-efficacy, identity, engagement, thriving at work and calling [43]. However, future work self is concerned with the goal and directional efforts and emphasizes the significant function in shaping positive behaviors, which has been largely ignored in previous research. The componential theory of creativity shows that individual learning sets the stage for individual creativity, and an individual's motivation can generate creativity through shaping learning behaviors. Informal field-based learning (IFBL), which represents an individual's engaging in self-directed, intentional and field-based development, is thus vital in pursuing workplace creativity [44]. Under the framework of future work self, employees may actively carry out IFBL to improve the knowledge and skills required for creativity, and therefore it was expected in this study that IFBL would exert a mediating effect between future work self and creativity.

Individual differences have proved to be an essential role in internal motivation and behavior choice. Proactive personality is a spiritual asset, defined as a stable individual difference in which individuals adopt active behaviors and explore new ways to influence the external environment [45]. In today's highly uncertain and competitive environments, future work self becomes extremely important in guiding employee behaviors, especially under the circumstance of employees with a higher proactive personality being inclined

to adopt positive self-evaluation, follow self-development coping strategies and improve themselves continuously to realize individual career goals [46,47]. Based on the theory of self-consistency, a proactive personality is likely to stimulate more initiative learning behaviors, such as IFBL, to promote the consistency of motivation, behaviors and personality in order to achieve future work self [48]. Therefore, this study also examined how a proactive personality may affect the dynamic process whereby future work self drives IFBL to achieve high individual creativity for high innovation performance.

Our study contributes to the literature in several ways. Firstly, we used the self-consistency theory to incorporate future work self and informal field-based learning to predict employee creativity in order to help organizations improve their innovation performance, thus identifying the motivational, directional and operational role of future work self in expanding employee creativity research. Secondly, our study introduced informal learning in employee creativity and explored the mediating role of informal field-based learning. This mechanism has not been well studied in prior research. Thirdly, we depicted the boundary role of proactive personality, which strengthens the impact of future work self on IFBL and then moderates the mediation effect of IFBL. The resulting moderated mediation model on future work self, proactive personality, IFBL and employee creativity will make essential contributions to a better understanding of how an employee's future-oriented self-concept can improve employee creativity for better organizational performance.

## 2. Literature Review and Hypothesis Development

### 2.1. Self-Consistency Theory and Future Work Self

Self-concept reflects an individual's cognition, evaluation and positioning of self. The self-concept has experienced several ups and downs since it was proposed in 1890 [49]. With the emergence of humanism, the self-concept has reshown its vitality. Under this context, scholars have begun to focus on the possible self, which is the future orientation of the self-concept [50]. It consists of three structures and two attitudes. The three structures include hope-self (what I am willing to do in the future), expect-self (what I may do in the future) and fear-self (what I do not want to do in the future) [51]. Combining hope-self and expected-self forms a positive possible-self, and fear-self forms a negative possible-self [52]. Strauss et al. further developed positive possible-self into the field of work to form the concept of future work self, reflecting the descriptions and expectations of future self-concepts in the workplace [39].

The self-consistency theory believes that self-concepts arise from the individual's long-term attitude and cognitive evaluation process and will impact behavior tendencies through internal motivation [53]. The dynamic self-concept emphasizes the continuity of the current self-concept and future self-concept. Individuals usually conduct behavior based on dynamic self-concepts to ensure their cognitive evaluation system's harmony [54,55]. The cognitive evaluation is also closely related to personality. When the self-concept and personality are consistent, the motivation explains the behavioral tendency and outcomes more strongly, specifically, the future work self as a part of dynamic self-concept. When future work self is salient, it will prompt employees to take initiative behavior to achieve self-consistency, especially when the proactive personality is high.

Building on the theory of self-consistency, future work self contains two features. On the one hand, future work self helps individuals form action plans based on future goals [56]. By drawing a blueprint and framework for future work, establish the goal of individual development, and then through the cognitive evaluation process of the current self and the future self, provide guidelines and plans for employee behavior choice. On the other hand, future work self is the source of internal motivation at work. Future work self stimulates intrinsic motivation through three mechanisms: self-cognition, identity and self-regulation. Firstly, the future-oriented cognition process is not a dream but requires individuals to sort out and recognize their current state, resources and abilities. Based on this, they combine their ideals and reasonably expect to estimate and achieve the cognition

of future work self; whether it is a comprehensive self-reflection or reasonable expectation is conducive to understanding themselves more clearly and stimulating their motivation. Secondly, the future work self helps clarify the future career target, thereby generating a sense of identity for a specific work. Consistent research proves that identity is an essential factor in stimulating an individual's intrinsic motivation [57]. Thirdly, self-consistency refers to how individuals actively adjust their cognition and behaviors to achieve harmony. Future work self allows individuals to discover the gap between the current and future working self through comparison and psychological stimulation, thereby activating the intrinsic motivation and engaging in initiative behavior.

## 2.2. Future Work Self and Employee Creativity

Employee creativity is not innate or random but can be activated and nurtured. Employee creativity is reflected in the pursuit of difficulties and quandaries in the process of achieving work goals. The process in which employees break their habitual thinking and conventional methods and adopt new and valuable technologies and means to solve the complication in fieldwork embodies employee creativity [58]. Researchers have noticed the role of creative self-efficacy in creativity research [59]. As cognitions and convictions about one's creative abilities and the perceived nature of creativity, creativity self-efficacy is a critical antecedent of creativity and innovation behavior [60]. Especially under the framework of self-consistency theory, the formation and development of creative self-efficacy have a more prominent effect on individuals' behavior choice and innovative performance [61].

In the creativity literature, creative self-efficacy plays an important role in shaping employee creativity and innovation performance [59,62]. To explain the curiosity about "what laypeople think about creativity," recent studies show that creative mindsets shape creative self-efficacy and allow creative endeavor to flourish [63]. All these studies demonstrate that self-efficacy is closely related to the creative and innovation process. Interestingly, the relationship between creative self-efficacy and creativity behavior is stronger when the self-concept is related to future tasks [64]. It is expected that a more salient future work self will meet with high creative self-efficacy and employees will have distinct perseverance in overcoming challenges, leading to creativity changes, to maintain a consistent relationship between future work self, creative self-efficacy and actual creativity behaviors.

Following prior research, the motivation for creativity directly determines the strength, direction and durability of the employee's creativity [65]. However, creativity motivation lacks a persuasive explanation for why employees take the initiative to improve their creativity and why employees spontaneously manage their behavior. The purpose of proactive workplace behavior is more about future results than immediate benefits [66]. Future work self, as ambitions and expectations of an employee, integration of internal motivational factors and behavioral shaping factors, can explain the causes of employee's initiative and spontaneous behavior at work. The salience of future work self can inspire employees to think about career development, proactively identify potential opportunities and actively strive [67]. Researchers have found that future work self can effectively predict organizational citizenship behavior, career management and job performance [68].

We believe that future work self would affect employee creativity through three paths. (1) Compared with other employees, an individual with a lucid imagination of future work self is more inclined to have a high level of creative self-efficacy and identity. Empirical studies have shown that creative self-efficacy and creative personal identity positively predict creative potential and creative achievement [64]. Such employees will continuously seek to improve their abilities and qualities, seek for breakthroughs and make changes actively, strive to overcome habitual behaviors and adopt creative methods to achieve their goals in the future as consistent with their future work self. (2) As a crucial motivational resource, future work self can stimulate an individual's creative thinking about future possibilities. Future work self exhibits strong internal motivation for future work, which is full of interest in future work and ongoing challenges encountered in pursuing goals,

thereby improving employee creativity. (3) Compared with goals, future work self is more specific. Future work self not only provides the direction of future development but also points out a clear development path, that is, future work self can reduce ambiguity and uncertainty in the process of creativity. In fact, successful innovation and creativity rest on the requisite reduction of ambiguity [69]. Future work self can promote an individual's attention to diversified information, maintaining a relatively open state for feedback and comments, to identify and seize creative opportunities and pursue creative achievement.

Indeed, some available evidence also indirectly suggests that future work self helps shape the circumstances and boundary conditions required for creativity. The organization-based self-concept of employees, including insider identity awareness and organizational self-esteem, helps motivate employees to generate more dynamic behaviors [70]. The gap in self-concept between current and future assessments encourages employees to improve their ability and quality continuously, and the process of self-improvement is often accompanied by high creativity. Future work self stimulates employees to generate spontaneous and active behaviors by activating the dynamic self-concept adjustment process and can also inspire employees to generate spontaneous and active behaviors, thereby promoting the improvement of creativity. Future work self enables employees to understand themselves more clearly, strengthens the individual's attention to relevant information, keeps them relatively open to heterogeneous information and makes it easier to understand and accept others' opinions. Hence, future work self strengthens their own identity and helps improve creativity self-efficacy, which has proven to be an important factor in employee creativity [71]. Team-level research has shown that the presence of a strong vision or team goal-orientation can effectively predict team innovation performance [72], and future work self as direction and goal at the individual level should have the same utility.

The theory of self-consistency states that the individual's external behavior is consistent with internal motivation, emphasizing the continuity and stability of the past, present and future self-concepts. As part of a dynamic self-system, future work self can inspire employees to set positive goals, plan development paths and take corresponding actions to stimulate individual vitality of creativity. Thus, we predict:

**Hypothesis 1.** *Future work self has a positive effect on employee creativity.*

### 2.3. *The Mediating Role of Informal Field-Based Learning*

Absorptive capacity theory suggests that learning demonstrates essential utility in absorbing new knowledge. Learning ability can strengthen employees' flexibility and is the main factor for improving creativity. Strong learning ability can enable employees to achieve leap-forward progress from imitation and improvement to creativity, thereby gaining a competitive advantage [73,74]. Ambiguity is an inherent component of the creation process, and learning is also the key to reducing ambiguity to achieve successful creation and innovation [69,75]. Employee learning in enterprises mainly includes formal learning and informal learning. Formal learning refers to designing clear learning plans for individuals to acquire specific knowledge, skills and abilities. Correspondingly, when there is no clear learning plan and no specified learning content, learning that is entirely autonomous by employees is informal learning. In the rapidly developing business environment, the function of informal learning is emphasized. Statistics show that the proportion of employees acquiring new knowledge through informal learning exceeds 70% [44]. Compared with formal learning, informal learning is more autonomous and proactive, and thus employees can choose what knowledge to learn. Consequently, the knowledge acquired by employees in informal learning is more suitable for them to meet challenges inherent in the process of creativity. Therefore, a large part of the knowledge required for creativity and innovation could come from informal learning. There are many concepts for describing employee's informal learning, such as incidental learning, spontaneous learning, experiential learning and self-directed learning, which shows the complexity and ambiguity of informal learning.

We revolve around informal field-based learning (IFBL) which is mainly based on two considerations. Firstly, the concept must concentrate on the behaviors that happen in the organization and exclude concepts that cover other areas. Secondly, since the study is carried out in the framework of future work self, employees' informal learning must be conscious, purposeful and self-directed. Wolfson et al. defined IFBL as "engaging in intentional self-directed behaviors aimed at learning new, work-oriented, and organizationally valued content outside of a formal learning program" [44]. IFBL contains three major dimensions: (1) experimentation/new experiences, which means that employees dare to try, seek and experience new work methods and content and are willing to try different missions and learn from their failures; (2) feedback/reflection means that individuals actively seek others' feedback and suggestions and actively reflect on their own work experience; and (3) vicarious learning refers to individuals purposefully noticing others' work patterns and exchanging experiences. Vicarious learning behaviors also include searching for books, online and other channels to obtain knowledge about the job. IFBL is self-directed behavior with clearly goal-oriented and proactive behavior that stimulates through motivation [76].

Specifically, when employees conduct IFBL, they need to make a bold trial error and have the courage to try new challenges. The knowledge gained in continuous trial error and challenge strengthens their resilience and inspires their desire to explore the unknown. Learning from mistakes and accumulating experience can let employees learn how and why. The goal-oriented, clear process and not being afraid of failure can make employees no longer confined to the organization's requirements and accumulate experience to bring more new knowledge and skills, thereby improving their creativity. Continually trying new work content is conducive to generating new ideas and perspectives for employees, forming unique ways of working and improving employee creativity [77]. In addition, the courage to not fear failure and the spirit of exploring the unknown are essential qualities that can significantly improve employee creativity [78].

Reflection and feedback run through the entire learning process. Reflection refers to recognizing and evaluating themselves, and feedback refers to the evaluation and suggestions from others. Both are the processes of cognition, thinking and evaluation of completed or ongoing work tasks [79,80]. As a significant part of IFBL, reflection enables employees to comprehensively summarize experiences, calmly think about problems and get more suggestions through feedback, which helps them continuously use new cognition to adjust work programs, break through stereotypes dynamically and improve creativity. Moreover, reflection and feedback are essential information collection methods. Whether it is reflection or feedback, it helps to form diversified thinking and promote employee's creativity.

Vicarious learning is a valuable learning method in IFBL. The vicarious learning object can be experienced masters, excellent colleagues, examples and information on the Internet. Vicarious learning can effectively integrate existing resources and most intuitively and effectively teach the knowledge and skills needed at work [81]. As the so-called "stand on the shoulders of giants," vicarious learning can help employees acquire new knowledge, absorb other people's experiences, skills, ideas and combine employee's knowledge and competence to create a spark of creation. Therefore, no matter experimentation and new experiences, reflection and feedback or vicarious learning, IFBL can enable employees to acquire diversified knowledge and skills and promote employee creativity.

Because IFBL is different from formal learning, there are no explicit requirements and constraints, and therefore employees need to have apparent goal pursuit [82]. IFBL does not occur independently, and it needs the stimulation of internal motivation factors such as self-efficacy. Future work self can play the role of motivation to stimulate individuals to take initiative behavior in the workplace. Self-consistency theory asserts that individuals have a steady demand to unify self-concept and behavior choice; self-concept will affect employee behavior choices. To achieve future work self, employees will take a series of proactive actions, such as IFBL, to improve their ability and quality and obtain diversified information. The realization of future work self relies on regulating behavior, and IFBL

serves as a bridge to narrow the gap between reality and the future, further stimulating employee creativity. Thus we predict:

**Hypothesis 2.** *Informal field-based learning positively mediates the relationship between future work self and employee creativity.*

#### 2.4. The Moderating Role of Proactive Personality

We further suggest that a proactive personality moderates the relationship between future work self and IFBL because the strategy selection of consistency of motivation and behavior is mostly determined by personality [83]. As a stable personality characteristic, a proactive personality is committed to adopting positive behavior to bring about meaningful change in work and life [45]. It is a crucial factor associated with self-cognition and behaviors [84]. Employees with a strong proactive personality tend to adjust their motivation and take positive actions to self-improve to achieve their career goals, rather than satisfy the existing state [85,86].

Highly proactive personality employees are more willing to engage in IFBL when they feel the gap between their current and future self. First, proactive employees act in the initiative and creative behaviors to pursue their goals persistently. When the future work self is salient, they are more inclined to try new work methods, experience new work content continuously, calmly face the failure process's risks, sum up the experience from the failure and re-enter the new informal learning process. Second, employees with a strong proactive personality are good at identifying opportunities and grasping opportunities, and thus in the process of continuously chasing future work self, employees are more sensitive to discovering future direction and making reflections in the process of pursuing to adjust behaviors further [87]. At the same time, employees who have a high quality of proactive personality often appear to seek feedback actively, collect comments and suggestions from leaders and colleagues and help themselves to improve continuously. Finally, the proactive individual has a broad acceptance of information and resource, can better integrate and integrate the required information and resources, especially when the information and resources are related to future work self. Proactive employees are good at observing others' work and summing up others' experiences. Through vicarious learning, they obtain the information and resources needed for work, laying the foundation for creativity. Therefore, a proactive personality can strengthen the relationship between future work self and IFBL. Conversely, when the degree of employees' proactive personality is low, they tend to refuse to accept change and cannot bear the risk of failure. They focus on accomplishing current task performance, with little willingness to follow other information and difficulty stimulating positive behaviors to pursue future work self [46].

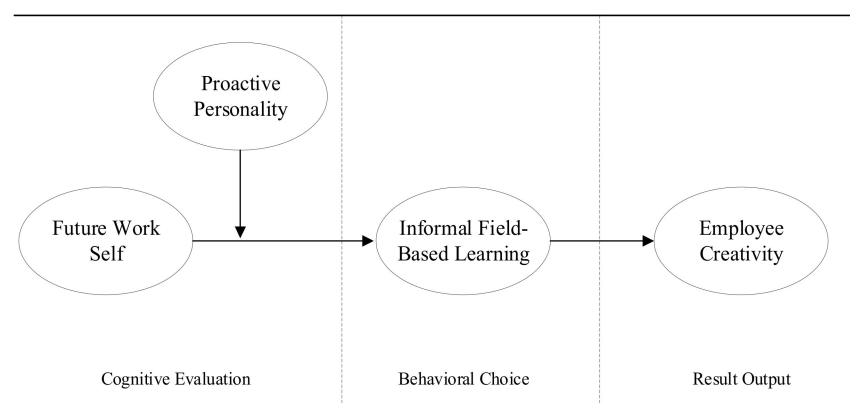
With the same level of motivation, a proactive personality will affect individual behavior choices. A stronger proactive personality helps employees continuously make new attempts and seek more information resources, making them more willing to devote themselves to IFBL.

Many studies have proved that employee creativity and personality traits are inextricably linked [88,89]. Employees with high quality of proactive personality collect more information, have a broader vision and have more initiative and execution. The positive behaviors help employees continue to expand their learning methods, enabling employees to achieve creativity through various learning channels. According to self-consistency theory, individuals' behavior will be consistent with their inherent motivations, goals and personality traits. Employees with a strong proactive personality are more willing to experiment with new ideas, reflect on feedback and learn vicariously under the inspiration of future work self to improve employee creativity. Therefore, based on the mediating role of IFBL and the moderating role of a proactive personality, a reasonable moderation mediation model is established.

**Hypothesis 3.** *Proactive personality moderates the relationship between future work self and IFBL such that the relationship will be stronger for those with a highly proactive personality.*

**Hypothesis 4.** *Proactive personality moderates the mediating role of IFBL between future work self and employee creativity, such that the indirect effect will be stronger for those with a highly proactive personality.*

Our research model is shown in Figure 1, which consists of three stages: cognitive evaluation includes future work self and a proactive personality, behavior choice includes IFBL, and result output includes employee creativity.



**Figure 1.** The research model.

### 3. Methods

#### 3.1. Sample and Procedure

We collected data from R&D department employees from eight high-tech companies in Beijing, Taiyuan and Shanghai provinces in China ( $n = 240$ ). Four of the companies belong to the information technology industry, two companies belong to the high-speed railway manufacturing industry, and two companies belong to the biomedical industry. The sample selection of our study follows two conditions: first, the employee's work emphasizes and attaches importance to creation, and second, the sample must be a formal employee after formal training of the enterprise, with sufficient time and space to conduct IFBL, and have the opportunity to think about future work self. After the purpose of the study was explained, field-based surveys began; they were assured of anonymity. To help reduce the effect of homologous errors, we conducted two-time questionnaires. In the first round of questionnaires, we measured the demographic information, future work self, proactive personality and IFBL. After two weeks, the second wave of questionnaires focused on the employee creativity of those employees who completed the first round.

The final sample included 201 valid questionnaires (the response rate was 83.75%). Among them, women accounted for 28.86% and men accounted for 71.14%. The average age of the sample was 33.51 years, and the average job tenure was 8.16 years.

#### 3.2. Measures

All surveys were translated from English into Chinese, followed by the translation/back-translation procedure. At the same time, enterprise experts were invited to revise and improve the wording following the field's basic situation to ensure that participants could clearly understand the items' content. All measurements used the Likert Response Scale, ranging from 1 "Strongly disagree" to 7 "Strongly agree".

The salience of future work self was measured using the 4 items scale reported at time 1, developed by Strauss et al. [39]. Cronbach's alpha was 0.85. Informal field-based learning was measured at time 1, using the 9-item scale developed by Wolfson et al. [44]. Three subscales were included: (1) feedback and reflection-based learning, (2) vicarious learning and (3) learning through experimentation and new experiences. Cronbach's alpha was 0.83. Employee creativity was measured using the 4-item scale reported at time 2, the same as in Farmer, Tierney and Kung-Mcintyre's research [90]. Cronbach's alpha was 0.89.



Proactive personality was measured with a 4-item scale developed by Bateman and Crant at time 1 [45]. Cronbach's alpha was 0.81.

Demographic variables can influence behavioral results and lead to distorted results. Binnewies, Ohly and Niessen found that employee creativity is age-dependent [91]. Studies have shown that gender, educational background and job tenure significantly impact employee creativity behavior [92–94]. Noe, Twes and Marand also used these factors as control variables in research on informal learning in the workplace [95]. Therefore, we controlled the employee's age, gender, education and job tenure and measured them in round 1.

## 4. Analysis and Results

### 4.1. CFA Test and Descriptive Statistics

To examine the empirical distinctiveness of the measures of the future work self, IFBL, proactive personality and employee creativity, we performed confirmatory factor analyses (CFAs) using Mplus 7.0. Table 1 shows that four-factor model (Basic model) fit indices demonstrated acceptable fit (RMSEA = 0.07, CFI = 0.91, TLI = 0.90, SRMR = 0.07). We then compared the basic model with other models; the fit indices were significantly better than those alternative models.

**Table 1.** Results of confirmatory factor analysis.

Model	Factors	RMSEA	CFI	TLI	SRMR
Four-factor model	F, I, C, P	0.07	0.91	0.90	0.07
Three-factor model	F, C, I + P	0.09	0.86	0.84	0.11
Two-factor model	F + C, I + P	0.12	0.75	0.72	0.10
Single-factor model	F + C + I + P	0.17	0.50	0.43	0.15

Note: F: future work self, C: employee creativity, I: informal field-based learning, P: proactive personality.

Table 2 presents descriptive statistics, including means, SDs and correlations for the focal variables. Results show that future work self significantly correlated with gender, education background, IFBL and employee creativity. IFBL significantly correlated with gender, education background, proactive personality and employee creativity. These significant correlations provide the necessary fundamentals for hypotheses tests. To assess the common method bias in this study, we conducted a multi-collinearity test based on variance inflation factors (VIFs). Our estimations callout that all latent variables VIFs ranged from 1.42 to 2.29, below the acceptable level of 3.3 suggested by Kock [96], indicating that multi-collinearity bias could be acceptable.

**Table 2.** Results of descriptive statistics and correlations.

	Mean	SD	1	2	3	4	5	6	7
1. Gender	1.27	0.44							
2. Age	33.51	3.99	−0.23 **						
3. Tenure	8.16	4.84	−0.16 *	0.83 **					
4. Education	3.93	0.58	0.07	−0.20 **	−0.41 **				
5. Future Self	5.80	1.02	0.24 **	−0.13	−0.08	0.17 *			
6. IFBL	5.35	1.05	−0.46 **	−0.12	−0.05	0.16 *	0.28 **		
7. Personality	5.00	0.82	−0.09	0.10	0.08	0.01	0.07	0.39 **	
8. Creativity	5.32	0.95	0.19 **	0.01	0.02	0.11	0.39 **	0.32 **	0.24 **

Note: \*  $p < 0.05$ , \*\*  $p < 0.01$ . Gender: male = 1, female = 2. Education: 1 = high school or lower, 2 = junior college, 3 = university degree, 4 = master degree, 5 = doctor degree.

### 4.2. Hypothesis Testing

To test the direct effects and mediation effects, we implemented the procedure suggested by Baron and Kenny [97]. We established five models to estimate this process. Table 3 presents the regression analysis results. Model 1 and 2 showed that future work

self significantly positively predicted employee creativity ( $\beta = 0.44, p < 0.01$ ) and IFBL ( $\beta = 0.42, p < 0.01$ ). By including IFBL in model 3, the results indicate that future work self and IFBL significantly affect employee creativity but with decreasing magnitudes (the coefficient of future work self decreased from 0.44 to 0.30). Complementarily, we adopted the bootstrapping technique of resampling with 5000 subsamples to verify the indirect effect of IFBL [98]. The result of the mediation estimation revealed that the 95% CI for the indirect effect of IFBL did not include zero (IE = 0.09; 95% CI [0.03, 0.18]), and the indirect effect was positive and significant. In line with these findings, hypotheses 1 and 2 are accepted.

**Table 3.** Direct and mediation effects.

Variables	Model 1 (Creativity)	Model 2 (IFBL)	Model 3 (Creativity)	Model 4 (IFBL)	Model 5 (IFBL)
Gender	0.09	−0.25 **	0.28 **	−0.21 **	−0.21 **
Age	0.02	0.03	0.01	0.02	0.01
Tenure	0.01	−0.01	0.01	−0.01	0.01
Education	0.10	0.25 **	0.01	0.24 *	0.28 **
Future work self	0.44 **	0.42 **	0.30 **	0.37 **	0.35 **
IFBL			0.31 **		
Proactive personality				0.53 **	0.53 **
Future * Proactive					0.19 *
R <sup>2</sup>	0.23	0.40	0.32	0.56	0.59
F-value	49.35 **	46.64 **	36.89 **	67.91 **	14.63 **

Note: \*  $p < 0.05$ , \*\*  $p < 0.01$ .

We further examined the moderating role of a proactive personality by the interaction approach [99]. We standardized the focal variables and then the creative interaction term of future work self and proactive personality. According to the estimation, proactive personality moderated the effect of future work self on IFBL ( $\beta = 0.19, p < 0.05$ ). The result suggests that the effect of future work self on IFBL is stronger when the proactive personality is high rather than low. In support of hypothesis 4, following the Monte Carlo simulation procedure, the indirect effect of future work self on employee creativity through IFBL was significant under the condition of higher proactive personality (IE = 0.17,  $p < 0.05$ ; 95% CI [0.07, 0.21]) but not significant under the condition of lower proactive personality (IE = 0.06, ns; 95% CI [−0.01, 0.10]). The between-condition difference was significant ( $\Delta$ IE = 0.11,  $p < 0.05$ ; 95% CI [0.01, 0.12]). Hypotheses 3 and 4 are both accepted.

## 5. Discussion

The paramount goal of this study was to introduce future work self as an essential antecedent of individuals' informal learning behavior to increase individual creativity. Specifically, our study examined the mediating effect of IFBL on the causal relationship between future work self and employee creativity and further the moderating role of proactive personality in this indirect effect. The findings of this study will have important theoretical and managerial implications in research on creativity and innovation management. We summarize the contribution of this study in Table 4.

### 5.1. Theoretical Implications

The findings of this study make several contributions to the body of literature. Contemporary research on employee creativity focuses on the impact of leadership, organizational climate and organizational resources on employee creativity [100]. These studies are often based on the traditional assumption of passive employee response and contend that external motivation stimulates employee creativity and innovation performance. However, in the new era of the knowledge economy, employees are becoming more and more proactive and autonomous in organizations. Therefore, we focused on exploring the individual intrinsic factors of employee creativity. More recent research has pointed out that creativity

studies should pay more attention to the internal mechanism and activate employees' innovation genes [101]. As an important and emerging motivating factor for workplace initiative, future work self can broaden the creative thinking of employees about future possibilities and makes them more actively engaged in initiatives to increase creativity and innovation performance. Hence, our study intended to explore the impact of future work self on employee creativity based on the self-consistency theory, and the results show that future work self has a significant impact on creativity.

**Table 4.** Contribution summary.

Models	Implications
The direct effect of future work self on employee creativity.	<p><b>Theoretical Implications:</b></p> <ol style="list-style-type: none"> <li>1. Reveal the internal motivational effect of future work self on employee creativity.</li> <li>2. Verify the effect of self-concept and future self-perception on creativity, under the framework of self-consistency theory.</li> </ol> <p><b>Management Implications:</b></p> <p>Managers can focus on cultivating employee's future work self-concept and encouraging their future career development to improve creativity and innovation performance.</p>
The mediating effect of IFBL.	<p><b>Theoretical Implications:</b></p> <ol style="list-style-type: none"> <li>1. Provide empirical evidence that informal learning is a key factor for employee creativity and innovation.</li> <li>2. Enrich the description of learning behavior in Amabile's creativity componential theory and emphasize the important role of informal learning.</li> </ol> <p><b>Management Implications:</b></p> <p>Managers can build a supportive climate for informal learning, create a feedback channel, and provide reflection opportunities and adopt a suitable IFBL method for industry characteristics to improve creativity and innovation.</p>
The moderating effect of proactive personality.	<p><b>Theoretical Implications:</b></p> <ol style="list-style-type: none"> <li>1. Indicate the impact of individual personality differences on IFBL and creativity.</li> <li>2. Confirm that under the consistency of self-concept, motivation and personality, individuals can better stimulate initiative behavior and creativity.</li> </ol> <p><b>Management Implications:</b></p> <p>Managers can establish proactive personality assessment programs for employee selection, training and work arrangement.</p>

This study expands the research field of creativity and innovation management and further reveals the mechanism through which individual possible self-concept helps increase employee creativity. Drawing on the self-consistency theory, we found that the more an individual holds a clear and salient future self, the more this will create a discrepancy that motivates creativity behaviors. Having an accessible representation of future work self appears to give meaning to a proactive attitude and behavior that would offer courage and strength to generate novel and useful ideas to meet the challenges at work. Consistent with the view of the possible self's effect of motivational effect, this study on future work self as a motivational resource offers the reason why people are willing to engage in creativity instead of what people can do, which can also directly stimulate creative thinking about the desirable future. These results also suggest that we may further advance our understanding of intrinsic motivation mechanisms by extending current creativity research to include other self-concept and self-cognitive processes that have been shown to relate to creativity, such as creative self-efficacy and goal orientation.

In addition, this study offers a novel perspective on creativity research: the impact of future work self on creativity within the context of self-consistency. When an employee has a salient future work self, it can act as a future goal for him/her to achieve to be consistent, with informal learning to help accomplish this goal. The future work self can enhance employee creativity by recognizing the future goal at work and provide a long-term plan of behavior through evaluating the gap between the present and future self, which is very important to avoid the dark side of creativity.

The findings on the mediating effect of IFBL also contribute to the burgeoning interest in organizational informal learning behaviors. Amabile's creativity componential theory point out that learning behaviors and individual skills and knowledge are critical factors in shaping creativity, and the role of formal learning in the promotion of creativity has been well verified [7,58]. Nevertheless, the effect of informal learning has received little empirical evidence. In keeping with the componential theory of creativity, our results provide empirical evidence that informal learning is also a key factor for employee creativity in the new era. Future work self effects on employee creativity and innovation performance are not just about goals but also about a process that continuously adopts proactive behaviors to improve their knowledge and skills. Learning is a crucial behavior for individuals to achieve the transformation from goal to outcome. Future work self provides learning directions, strategies, methods and principles for IFBL and then stimulates employee creativity through diversified informal learning methods. In addition, this study is also a response to Wolfson et al.'s call for "emphasizing the importance of IFBL behaviors in the workplace" and further provides evidence that IFBL could effectively promote employee creativity and innovation performance [44].

Finally, our study found that a proactive personality positively moderates the relationship between future work self and IFBL. Employees with a stronger proactive personality are more willing to adopt a variety of informal learning behaviors at the workplace to improve creativity when they have a strong salience of future work self, which is another important factor in innovation management. The moderation role of proactive personality confirms the important role of individual differences in IFBL. It also confirms that only under the condition of harmony between an individual's internal goals, motivations and personality can individuals better stimulate the corresponding initiative behavior, continuously improve themselves and achieve high employee creativity to improve innovation performance. Hirst et al. contended that goal orientation is positively related to employee creativity only when the context is positive [58]. A proactive personality lays the foundation for an individual to maintain a more positive attitude and carry out informal learning behaviors, thereby strengthening the relationship between future work self and employee creativity.

### 5.2. Management Implications

The findings of this research provide a new perspective on innovation management in organizations. Firstly, when organizations try to improve employee creativity, they can focus on cultivating employee's future work self-concept and informal learning behaviors, in addition to strengthening external incentives, such as improving organizational and leadership support for creativity. Organizations can guide employees to pay attention to their current self-state and think about future self-concepts, strengthen employees' control and planning of self-concepts and encourage employee's future career development through employee assistance plans to improve employee creativity and innovation performance. In addition, because leadership directly impacts employees' self-concept and work cognition, leadership may help improve employees' future work self. For example, empowered leadership may convey expectations and confidence to employees.

Secondly, for creativity and innovation, the improvement brought by employees' participation in learning behaviors with designated learning plans and content also applies to informal learning with more intentional self-control. Managers should create a supportive workplace atmosphere for informal learning, encourage employees to carry out various forms of autonomous learning, tolerate employee errors, support employees' experiments and encourage trying new work methods. Managers can also organize learning and exchange activities, create a feedback channel and provide reflection opportunities to establish informal learning fundamentals in the workplace. In terms of experimental learning, management needs to be aware that it can bring a positive result, whereas it may cause major crises in safety-oriented industries, such as the nuclear industry. Organizations need to choose suitable IFBL methods according to specific industry characteristics.

Thirdly, our findings suggest that a proactive personality is important when enhancing IFBL and creativity. When selecting employees for critical positions related to creativity and innovation, companies can give more attention to proactive personality individuals and develop particular selection criteria to promote employee creativity and innovation performance. Managers also need to be aware that employees with different proactive personality levels may demonstrate different levels of informal learning behavior leading to innovation outcomes. With the evidence generated from this study, different assessment programs can be designed to evaluate employees' proactive personality and future work self. If the employees have a relatively low level of proactive personality or future work self, more help and career counseling should be provided to employees to facilitate their learning and stimulate creativity. If the employees have a high level of proactive personality or salient future work self, sufficient autonomy should be provided to employees for their informal field learning and further creativity behaviors.

### 5.3. Limitations and Suggestions for Future Research

This study also had some limitations. Firstly, our model only focuses on the individual level. Both the self-consistency theory and the proactive personality emphasize the important influence of the environment on individual behavior choices. Therefore, future research can pay attention to organizational-level factors and explore the effect of cross-level interactions between context and individual factors, such as the impact of organizational orientation on future work self and related outcomes. Secondly, elaboration is another dimension of future work selves besides salience and refers to the degree of detail and complexity in their cognitive representation. Future work self is worthy of discussion only when the salience is high. Since the salience of future work self is a kind of efficiency motivation under the framework of self-consistency theory, future research can also explore the value of future work self. Finally, future research can also examine informal field-based learning at the organizational level, such as informal field-based learning climate, in order to better understand how future work self, personality and learning behaviors can jointly improve organizational innovation.

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