



How Does Flexible Human Resource Management Empower Employee Deviant Innovation? A Conservation of Resources Perspective

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ABSTRACT

Drawing on conservation of resources theory, this study examines how flexible human resource management affects employee deviant innovation. Survey data were collected from 282 employees working in information technology, machinery manufacturing, and biopharmaceutical firms in Shanghai, Hefei, and Zhejiang Province. Both dimensions of flexible human resource management, coordination flexibility and resource flexibility, were positively related to employee deviant innovation. Psychological resilience mediated both relationships. The supervisor-subordinate relationship moderated the link between psychological resilience and deviant innovation: the stronger the relationship, the weaker the positive effect of resilience on deviant innovation. These findings clarify how flexible human resource management shapes deviant innovation, identify the psychological mechanism through which it operates, and specify the relational condition under which that mechanism is strongest.



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Introduction

As the digital economy has developed, flexible human resource management practices such as remote work and flexible working hours have emerged and have substantially changed the traditional work environment. Employees enjoy greater freedom, and their behavior is far less likely to be interrupted by supervisors or colleagues. Against this background, deviant innovation offers an efficient way of breaking through the constraints on innovation and resolving the innovator's dilemma, and it has become an important route to innovation. A frequently cited illustration is the Sogou browser, which is reported to have originated when employees whose proposals had been rejected by their superiors continued to develop the idea privately (Lu et al., 2022). Existing studies explain the emergence of employee deviant innovation mainly from three angles: organizational characteristics, leader characteristics, and employee characteristics (Lin et al., 2016). Research that explains deviant innovation from a human resource management perspective remains scarce, and the question of how interactions between the human resource management system and contextual factors affect deviant innovation has attracted little attention. Deviant innovation is an important means by which firms overcome innovation inertia and strengthen competitive advantage (Globocnik et al., 2022; Yang et al., 2024), and it is far from rare in organizational practice. Two questions therefore follow: does flexible human resource management promote employee deviant innovation, and what is the mechanism at

work? By examining the effect of flexible human resource management on employee deviant innovation, this study moves beyond the leadership styles and organizational climates through which deviant innovation has usually been interpreted, and offers organizations more actionable guidance for channeling such behavior.

Employees are the principal agents of innovation in an organization, and firms want them to innovate actively and without fear of risk so that the organization can hold its competitive position. Firms nevertheless face an innovation paradox. On one hand, the organization expects employees to innovate on their own initiative. On the other, it rejects some employee ideas because of constraints such as limited resources and risk exposure. As the digital economy develops and technologies such as the internet and artificial intelligence continue to emerge, technological progress makes it increasingly possible for employees to innovate through unconventional means. We argue that flexible human resource management, which advocates designing human resource practices flexibly so as to adapt to changes in the external environment, may give rise to employee deviant innovation.

Deviant innovation is also a relatively risky behavior (Shukla & Kark, 2020), and employees need a firm internal drive if they are to face the challenges it involves. The willingness and the ability to continue innovative activity depend on inner psychological strength (Luthans & Youssef-Morgan, 2017). Employees who dare to engage in deviant innovation should possess sound psychological qualities, face setbacks calmly, and maintain a positive psychological state, since only this can sustain innovative behavior that lacks organizational support and violates organizational norms. Psychological resilience is a protective factor that helps employees confront difficulty successfully: it allows them to face difficulty without fear and to recover well once the difficulty has passed (Linnenluecke, 2017). Resilient employees are willing to try new strategies in uncertain environments and can accept and overcome challenges and failures with composure, and their positive psychological state lowers their perceived level of risk, which makes them readier to engage in deviant innovation. This study therefore takes psychological resilience as the representative personal resource and, from the perspective of resource conversion, explores the mechanism through which flexible human resource management affects employee deviant innovation.

The supervisor-subordinate relationship, also referred to in the Chinese management literature as supervisor-subordinate *guanxi*, is the interpersonal relationship between a leader and a subordinate (Law et al., 2000), and it is maintained through the long-term exchange of relational resources. According to conservation of resources theory, the resources a leader gives an employee are contextual resources that can be converted into personal resources and thereby affect behavior. Prior research finds that a leader's attitude toward innovative ideas is the main reason employees engage in deviant innovation (Lin et al., 2016). Outside the formal organizational structure, managers can use their authority to allocate departmental resources and provide employees with additional support, which allows employees to try out new ideas openly rather than going underground to innovate (Globocnik, 2019). This study therefore treats the supervisor-subordinate relationship as a moderator and examines whether it conditions the relationship between flexible human resource management and employee deviant innovation.

The paper makes three contributions. First, it examines the role of flexible human resource management in deviant innovation, filling a gap left by earlier research that discussed the topic largely from the perspective of informal organizational structure. It offers a theoretical account of how flexible human resource management affects deviant innovation, adds to the set of known antecedents, and provides organizations with practical strategies for stimulating and regulating employee innovative behavior. Second, working from conservation of resources theory, it investigates the mechanism through which flexible human resource management affects deviant innovation and thereby opens the black box of that mechanism. Third, by treating the supervisor-subordinate relationship as a moderator, it deepens research on flexible human resource management at the employee level.

Literature Review and Research Hypotheses

Flexible human resource management

Wright and Snell (1998) defined human resource flexibility as an organization's capacity to respond to a range of competitive demands rather than to the demands determined by its current strategy. The concept stresses adaptability in the deployment of human resources. Building on it, Chang et al. (2013) proposed the notion of flexible human resource management, defining it as a set of internally consistent human resource practices that help a firm acquire and develop human resources and reconfigure them more quickly and more effectively. Against the background of de-bureaucratization and decentralization, firms urgently need to make their human resource strategies more flexible so that they can keep improving the allocation of resources. Taking an organizational perspective, Chang et al. (2013) analyzed the adaptation of human resource practices to external change along two dimensions, resource flexibility and coordination flexibility. Resource flexibility refers to a set of measures through which an organization gives employees diverse opportunities for learning and development, thereby improving its overall adaptability and competitiveness. Coordination flexibility refers to the human resource practices an organization implements in order to allocate and integrate resources more quickly and effectively. Other scholars have analyzed the dimensions of flexible human resource management differently. Bal and De Lange (2015) approached it through perceived availability and perceived use, while Kalleberg (2001) approached workforce flexibility through the distinction between functional and numerical arrangements. Among these schemes, the one proposed by Chang et al. (2013) remains the most widely adopted (Way et al., 2018). This study therefore adopts their definition and examines the effects of coordination flexibility and resource flexibility on employee deviant innovation.

Flexible human resource management and employee deviant innovation

As the digital economy has developed, flexible human resource management practices such as remote work and flexible working hours have continued to emerge. These practices have to some extent disrupted the traditional work environment, and employees in such organizations experience more freedom and obtain more resources than they would under conventional arrangements. From the standpoint of conservation of resources theory (Hobfoll, 1989), human resource practices can be viewed as a channel through which the organization distributes resources to employees, and they have positive effects in areas as varied as relieving workplace stress, supporting self-directed activity, increasing occupational passion, and promoting employee growth (Hobfoll et al., 2018).

Coordination flexibility weakens the constraints that organizational rules place on employee behavior, so that employees can act on their own innovative ideas and take an alternative route by engaging in deviant innovation. Delegating authority, involving employees in company decisions, and giving them access to important company information (Chang et al., 2013) grant employees considerable discretion, which increases the likelihood that they will propose multiple solutions and adjust their approach to a task. Job autonomy captures the freedom and discretion employees hold over scheduling, work methods, and decision making when carrying out specific tasks (Morgeson & Humphrey, 2006). The greater an employee's job autonomy within the organization, the more likely innovative behavior becomes (Frate & Bido, 2024). Coordination flexibility also shifts the management of employees from a process orientation to a results orientation (Lautsch et al., 2009), so that employees attend to the legitimacy of the ends of deviant innovation rather than to the illegitimacy of the means. When innovation violates organizational norms, employees therefore tend to focus on the breakthrough performance that successful deviant innovation can bring and to pay less attention to the sanctions that norm violation might carry, which stimulates deviant innovation. Accordingly, we propose:

H1a: Coordination flexibility has a positive effect on employee deviant innovation.

Resource flexibility supplies employees with diverse resources and grants them the right to choose when and where they work according to task requirements, which increases both the concealment of deviant innovation and the stock of resources available for it. When employees and their leaders occupy different work spaces, the physical separation gives employees an advantage in keeping the innovation process private. Employees consequently receive less real-time feedback and information from their supervisors and are exposed to relatively little supervisory monitoring, which reduces the pressure that an employee with a deviant innovation idea would otherwise feel in interactions with leaders and colleagues. Under these conditions employees are less likely to worry about the risks of deviant innovation and are more inclined to believe in their own ability to produce creative results. Flexible human resource management thus gives employees freedom over where they work, and those with deviant innovation ideas can use this environment to act on them. In addition, effective training raises employees' professional skills, while job rotation and challenging assignments broaden their knowledge base (Chang et al., 2013). With an adequate stock of resources, employees become more likely to undertake deviant innovation. Accordingly, we propose:

H1b: Resource flexibility has a positive effect on employee deviant innovation.

The mediating role of psychological resilience between flexible human resource management and employee deviant innovation

Conservation of resources theory holds that individuals do everything they can to obtain, retain, and protect their resources, that they use existing resources to acquire further resources, and that they seek to recover quickly from resource loss (Hobfoll, 1989). Resources fall into two categories, contextual and personal. Contextual resources can influence or be converted into personal resources, which then shape behavior and outcomes (ten Brummelhuis & Bakker, 2012). Flexible human resource management practices provide employees with various resources, raise the level of their individual psychological resources, and thereby influence their subsequent behavior. Psychological resilience gives employees strong resistance in the face of difficulty and setback, allowing them to remain composed in adversity and to return quickly to a normal state after a crisis, and it constitutes a key personal resource.

Coordination flexibility, which emphasizes the rapid integration and allocation of resources, is an important driver of psychological resilience. Through delegation, employee participation in company decisions, and access to important company information, employees gain a degree of autonomy. Autonomy allows employees to explore different paths and options and to learn and grow from doing so, and this experience helps them handle future challenges, which strengthens psychological resilience. Autonomy also makes individuals more likely to take responsibility for their own behavior and decisions, and this sense of responsibility encourages them to persist when they meet difficulty, which further raises resilience. Through flexible human resource strategies, organizations can also create a work environment conducive to knowledge sharing and skill development. Such an environment involves policies that promote learning within the organization, tasks designed to enhance the adaptability of human capital, and opportunities for job rotation, all of which strengthen the fit between employees and their positions and improve how effectively their expertise is applied at work (Beltrán-Martín & Roca-Puig, 2013). Improved skills strengthen employees' sense of control over their tasks, and this positive self-perception helps build psychological resilience. On this basis, we propose:

H2a: Coordination flexibility has a positive effect on psychological resilience.

Resource flexibility is likewise an important driver of psychological resilience. Boundary theory holds that employees differ in their preferences regarding the work-family boundary. Some prefer a clear separation between work and family roles, while others prefer the boundary between the two to remain blurred (Gonsalves, 2020). In a resource-flexible work setting, the organization gives employees freedom over when, where, and how they work, so that they can manage the work-family boundary according to personal preference, which raises their job autonomy. Research finds that human resource practices such as remote work and flexible working hours promote work-life balance (Allen et al., 2013) and help employees gain

greater autonomy. Greater autonomy strengthens the capacity to cope with pressure and encourages employees to interpret and evaluate stressful events at work from a positive angle, which supports psychological resilience. Resource flexibility also emphasizes broad job design and training, which continually expand employees' knowledge and skills, enable them to deal better with difficulties at work, and strengthen their sense of control over tasks, so that they approach the uncertain challenges of a career positively and keep reinforcing their own psychological resilience (Vanhove et al., 2016). We therefore propose:

H2b: Resource flexibility has a positive effect on psychological resilience.

Deviant innovation has no official sanction, and once a superior discovers it the individual may face a series of negative consequences, including punishment by the supervisor and loss of reputation and trust (Globocnik & Salomo, 2015). To encourage this unconventional form of innovation, organizations should give employees more space and more opportunity for free exploration (Jiang et al., 2023). Because it ignores or violates existing organizational rules and policies, deviant innovation may also trigger conflict among colleagues and friction between superiors and subordinates (Mainemelis, 2010). Criscuolo et al. (2014) noted that employees who engage in deviant innovation typically hold two cognitive premises: that they are capable enough to complete the innovation, and that their environment is sufficiently safe. As a positive psychological quality, psychological resilience allows people to adopt an active stance toward problems in uncertain or high-pressure environments. Employees high in psychological resilience possess a strong sense of psychological safety (Frazier et al., 2017), which provides a supportive psychological environment and a sense of self-efficacy for their behavior in the organization (Luthans & Youssef-Morgan, 2017). Psychological resilience can also supply the persistence that deviant behavior requires: resilient employees have the ability and the courage to face setbacks and adversity and to resolve the difficulties they encounter creatively, and they may therefore be more willing to engage in deviant innovation. On this basis, we propose:

H3a: Psychological resilience mediates the relationship between coordination flexibility and employee deviant innovation.

H3b: Psychological resilience mediates the relationship between resource flexibility and employee deviant innovation.

The moderating role of the supervisor-subordinate relationship

The supervisor-subordinate relationship is the connection formed between an employee and a superior (Ma et al., 2023). Different orientations in this relationship divide employees into insiders and outsiders, and leaders manage insider subordinates and outsider subordinates differently. When a resilient employee decides whether to persist with an idea and carry out deviant innovation, that decision takes the quality of the supervisor-subordinate relationship into account. We argue that as the supervisor-subordinate relationship improves, the positive association between psychological resilience and employee deviant innovation weakens.

The supervisor-subordinate relationship can change how employees perceive the benefits of deviant innovation. Compared with outsider subordinates, insider subordinates obtain more work resources (Khan et al., 2023). Leaders trust subordinates with whom they are on good terms, are willing to delegate authority to them (Kim et al., 2018), and give them individual consideration. Managers can use their authority to allocate departmental resources and provide additional support, so that resilient employees can try out new ideas openly rather than going underground to innovate. The value of deviant innovation as a means of obtaining resources therefore declines. Such employees also give priority to maintaining interpersonal harmony with their superiors and treat maximizing benefits or improving performance as secondary (Chen et al., 2014). Leaders provide paternalistic care for subordinates, and the subordinate's basic obligation is obedience and deference to the leader (Chen et al., 2009). In this way, the supervisor-subordinate relationship may suppress

employee deviant innovation both in its purposes and in its means (Lu et al., 2022). For outsider subordinates the situation is reversed: because the resources they obtain from informal relations with the leader are limited, they may pursue unconventional innovative routes to raise their own standing once they perceive a bias in resource allocation (Wu et al., 2022).

The supervisor-subordinate relationship can also change how employees perceive the risks of deviant innovation. The stronger the relationship, the more an employee becomes an insider who receives greater trust and emotional support from the leader, and resilient employees of this kind can view innovation failure and risk in a more positive and open way and tend to innovate openly. Outsider subordinates, by contrast, receive less trust and emotional support, worry that violating organizational norms will bring questioning or criticism from superiors, and at the same time wish to change their disadvantaged position, so they tend to adopt a concealed form of deviant innovation. On this basis, we propose:

H4: The supervisor-subordinate relationship negatively moderates the relationship between psychological resilience and deviant innovation, such that the stronger the supervisor-subordinate relationship, the weaker the positive effect of psychological resilience on deviant innovation.

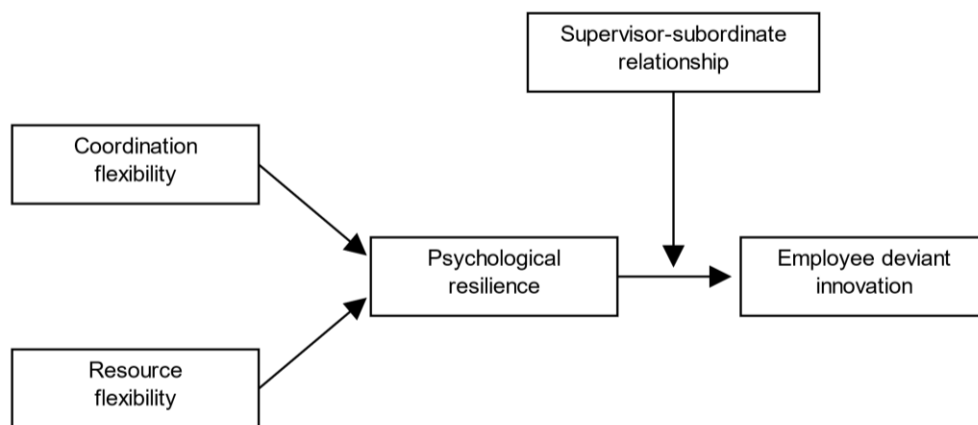


Figure 1: Research Model

Research Method

Sample and data collection

The sample firms are located in Shanghai, Hefei, and Zhejiang Province and cover several industries, including information technology, machinery manufacturing, and biopharmaceuticals. Before data collection began, the research team explained the purpose and procedures of the study to senior managers at the participating firms and conducted the survey only after obtaining their approval. All respondents took part voluntarily and provided informed consent before completing the questionnaire.

Two steps were taken to limit social desirability bias. First, all responses were anonymous, which reduces the influence of respondents' personal tendencies. Second, variable names did not appear in the questionnaire, which played down the purpose of the study and the meaning of individual items and encouraged respondents to answer on the basis of their own experience. The questionnaire was administered both online and offline. A total of 398 questionnaires were collected across the two channels, and after the responses were screened we obtained 282 valid questionnaires, an effective response rate of 70.85%.

Women accounted for 57.8% of the final sample and men for 42.2%. Employees aged 25 or under were the largest age group (29.1%), followed by those aged 31 to 35 (22.0%) and those aged 26 to 30 (20.6%). Employees with less than one year of organizational tenure formed the largest tenure group (28.4%), followed by those with one to three years (22.0%). Respondents holding a bachelor's degree or higher made

up 60.2% of the sample. Non-managerial staff formed the largest occupational group (53.2%), followed by front-line managers (27.0%).

Measures

The questionnaire covered demographic characteristics, flexible human resource management, psychological resilience, the supervisor-subordinate relationship, and deviant innovation. All constructs were measured with established scales developed by prior researchers. Every item was rated on a five-point Likert scale ranging from 1 (does not describe my situation at all) to 5 (describes my situation very well).

All scales were originally developed in English. Following the translation and back-translation procedure recommended by Brislin (1970), the original questionnaire was first translated by a bilingual researcher familiar with the research context. An independent bilingual researcher then back-translated the questionnaire into English. The original and back-translated versions were compared item by item to identify discrepancies in wording and meaning. Any discrepancies were discussed and resolved through consultation between the translators and the research team to ensure semantic and conceptual equivalence between the original and translated versions.

Flexible human resource management. We used the 11-item scale developed by Chang et al. (2013). Coordination flexibility contains six items, for example, “The company encourages employees to give feedback and suggestions and acts on them, so that these employees can be deployed quickly and effectively.” Resource flexibility contains five items, for example, “The company hires employees on the basis of diverse skills and experience so that they can take on other tasks.”

Psychological resilience. We used the six-item scale developed by Luthans et al. (2007). A sample item is “When I encounter setbacks at work, I always recover from them quickly.”

Supervisor-subordinate relationship. We used the six-item scale developed by Law et al. (2000). A sample item is “I take the initiative to share my views, problems, needs, or feelings with my supervisor.”

Deviant innovation. We used the five-item scale developed by Criscuolo et al. (2014). A sample item is “I take the initiative to spend time on unofficial projects that will enrich future official projects.”

Control variables. Gender, age, organizational tenure, education, and position were treated as control variables.

Analysis of Empirical Results

Reliability and validity

Table 1 reports the internal consistency and convergent validity of the five constructs. Cronbach’s alpha was 0.859 for coordination flexibility, 0.833 for resource flexibility, 0.884 for psychological resilience, 0.869 for the supervisor-subordinate relationship, and 0.825 for deviant innovation. All values exceed 0.80 and are well above the conventional criterion of 0.70, which indicates good internal consistency across all constructs.

Composite reliability (CR) and average variance extracted (AVE) were also assessed for the five constructs. The results indicate satisfactory composite reliability and convergent validity, with CR values exceeding the recommended threshold of 0.70 and AVE values meeting the recommended criterion of 0.50 (Fornell & Larcker, 1981).

Table 1: Reliability and convergent validity of the measurement model

Construct	Items	Cronbach's alpha	CR	AVE
Coordination flexibility	6	0.859	0.90	0.60
Resource flexibility	5	0.833	0.88	0.60
Psychological resilience	6	0.884	0.91	0.63
Supervisor-subordinate relationship	6	0.869	0.90	0.60
Deviant innovation	5	0.825	0.87	0.58

Note: CR = composite reliability; AVE = average variance extracted.

Discriminant validity was assessed in two ways. First, confirmatory factor analysis was used to compare the fit of alternative measurement models, and the results are reported in Table 2. The hypothesized five-factor model showed the best fit to the data (chi-square = 623.482, df = 340, RMSEA = 0.054, CFI = 0.930, TLI = 0.922, SRMR = 0.060). All alternative models fitted less well, with higher RMSEA and SRMR values and lower CFI and TLI values. These findings support the distinctiveness of the five constructs in the measurement model.

Table 2: Results of confirmatory factor analysis

Factor model	chi-square	df	RMSEA	CFI	TLI	SRMR
Five-factor model	623.482	340	0.054	0.930	0.922	0.060
Four-factor model	833.351	344	0.071	0.879	0.867	0.069
Three-factor model	1471.932	347	0.107	0.723	0.698	0.100
Two-factor model	1564.654	349	0.111	0.700	0.675	0.101
One-factor model	1748.194	350	0.119	0.655	0.628	0.105

Note: In the four-factor model, resource flexibility and psychological resilience were combined into a single latent factor. In the three-factor model, resource flexibility, psychological resilience, and the supervisor-subordinate relationship were combined into a single latent factor. In the two-factor model, resource flexibility, psychological resilience, the supervisor-subordinate relationship, and deviant innovation were combined into a single latent factor.

Second, following Fornell and Larcker (1981), discriminant validity was assessed by comparing the square root of the AVE for each construct with its correlations with the other constructs. As reported in Table 3, every inter-construct correlation remained below the square roots of the corresponding AVEs. The highest correlation was 0.652, between coordination flexibility and resource flexibility, which is below the smallest square root of AVE in the model (0.762). Taken together, the two tests support discriminant validity among the five constructs.

Descriptive statistics and correlation analysis

The means, standard deviations, and correlations of all variables are reported in Table 3. Coordination flexibility and resource flexibility were positively correlated with psychological resilience ($r = 0.632$, $p < 0.01$; $r = 0.582$, $p < 0.01$) and with employee deviant innovation ($r = 0.530$, $p < 0.01$; $r = 0.545$, $p < 0.01$). Psychological resilience was also positively correlated with employee deviant innovation ($r = 0.590$, $p < 0.01$). These patterns are consistent with the hypothesized relationships and provide preliminary support for the model.

Table 3: Means, standard deviations, and correlations

Variable	M	SD	1	2	3	4	5	6	7	8	9	10
1. Gender	1.578	0.495	1.00									
2. Age	2.642	1.403	0.012	1.00								
3. Organizational tenure	2.699	1.443	-0.009	0.687**	1.00							
4. Education	2.528	0.717	0.029	-0.123*	-0.086	1.00						
5. Position	1.716	0.895	-0.030	0.454**	0.393**	0.051	1.00					
6. Coordination flexibility	3.960	0.695	-0.036	0.167**	0.244**	-0.079	0.155**	0.775				
7. Resource flexibility	3.705	0.773	-0.062	0.255**	0.208**	-0.121*	0.124*	0.652**	0.775			
8. Psychological resilience	3.931	0.667	-0.045	0.251**	0.276**	-0.090	0.246**	0.632**	0.582**	0.794		
9. Supervisor-subordinate relationship	3.144	0.830	-0.170**	0.094	0.090	-0.076	0.071	0.316**	0.350**	0.322**	0.775	
10. Deviant innovation	3.579	0.717	-0.099	0.186**	0.119*	0.016	0.137*	0.530**	0.545**	0.590**	0.639**	0.762

Note: N = 282. Values on the diagonal in bold are the square roots of the average variance extracted for the five latent constructs. Gender, age, organizational tenure, education, and position are categorical control variables and are reported for descriptive purposes only. * $p < 0.05$, ** $p < 0.01$.

Test for common method bias

Because all measures were obtained from a single source at a single point in time, two procedures were used to assess common method bias (Podsakoff et al., 2003). Harman's single-factor test identified four unrotated factors with eigenvalues greater than 1, and the first factor explained 37.282% of the variance, which is below the 40% threshold commonly applied. A common method latent factor was then added to the five-factor measurement model and the change in fit was examined. Model fit after the common method factor was added (RMSEA = 0.056, SRMR = 0.066, CFI = 0.931, TLI = 0.919) did not improve appreciably relative to the original five-factor model (change in RMSEA = 0.002, change in SRMR = 0.006, change in CFI = 0.001, change in TLI = -0.003).

Neither procedure indicates a serious common method problem. Both tests are diagnostic rather than conclusive, however, and they cannot rule out common method variance entirely. The single-source design remains a limitation of the study and is discussed further below.

Hypothesis testing

Hierarchical regression was used to test the main effects, and Mplus was used to test the mediating and moderating effects. As Model 4 in Table 4 shows, coordination flexibility and resource flexibility were positively related to employee deviant innovation ($\beta = 0.334$, $p < 0.001$; $\beta = 0.304$, $p < 0.001$), which supports H1a and H1b. Model 2 shows that coordination flexibility and resource flexibility were positively related to psychological resilience ($\beta = 0.396$, $p < 0.001$; $\beta = 0.241$, $p < 0.001$), which supports H2a and H2b.

Table 4: Hierarchical regression results

Variable	Psychological resilience M1	Psychological resilience M2	Deviant innovation M3	Deviant innovation M4	Deviant innovation M5
Gender	-0.050	-0.011	-0.146	-0.103	-0.114
Age	0.025	0.006	0.095*	0.068	0.078*
Organizational tenure	0.079*	0.028	-0.015	-0.061	-0.066*
Education	-0.071	-0.021	0.036	0.087	0.081
Position	0.117*	0.089*	0.048	0.022	-0.028

Variable	Psychological resilience M1	Psychological resilience M2	Deviant innovation M3	Deviant innovation M4	Deviant innovation M5
Coordination flexibility		0.396***		0.334***	
Resource flexibility		0.241***		0.304***	
Psychological resilience					0.646***
R-squared	0.108	0.475	0.050	0.373	0.372
Adjusted R-squared	0.092	0.461	0.032	0.357	0.358
F	6.680***	35.366***	2.887*	23.266***	27.107***

Note: N = 282. Entries are standardized regression coefficients. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Mediating effect. Mplus was used with bias-corrected bootstrapping to test the indirect effects. Coordination flexibility was positively related to psychological resilience (beta = 0.445, 95% CI [0.253, 0.668]), as was resource flexibility (beta = 0.253, 95% CI [0.066, 0.440]). Psychological resilience was positively related to employee deviant innovation (beta = 0.477, 95% CI [0.206, 0.781]). With psychological resilience in the model, neither direct effect on deviant innovation reached significance: the coefficient for coordination flexibility was 0.138, 95% CI [-0.082, 0.387], and the coefficient for resource flexibility was 0.210, 95% CI [-0.007, 0.451]. Both confidence intervals include zero. The indirect effect of coordination flexibility on deviant innovation through psychological resilience was significant, 95% CI [0.096, 0.388], as was the indirect effect of resource flexibility, 95% CI [0.029, 0.275]. Neither interval includes zero. These results support H3a and H3b.

Psychological resilience therefore carries the effects of both dimensions of flexible human resource management on employee deviant innovation. We describe this pattern as mediation rather than as full mediation, since a non-significant direct effect in a single sample does not establish that no direct path exists. The upper bound of the confidence interval for the direct effect of resource flexibility falls only marginally short of significance, which reinforces this reading.

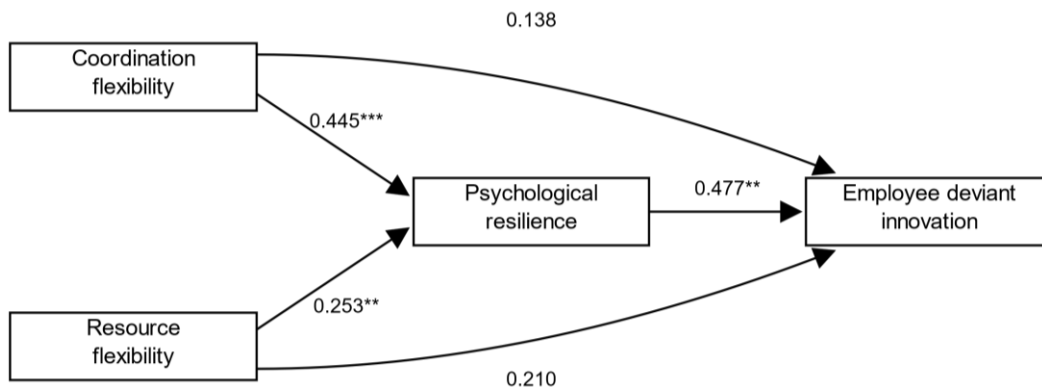


Figure 2: Structural equation path coefficients

Moderating effect. Mplus was used to test the moderating effect, and the results are reported in Table 5. Psychological resilience was positively related to employee deviant innovation (beta = 0.578, $p < 0.001$, 95% CI [0.397, 0.759]), and the supervisor-subordinate relationship was likewise positively related to deviant innovation (beta = 0.336, $p < 0.001$, 95% CI [0.248, 0.425]). The interaction term was negative and significant (beta = -0.162, $p = 0.010$, 95% CI [-0.285, -0.039]). The supervisor-subordinate relationship thus negatively moderates the relationship between psychological resilience and employee deviant innovation: the stronger the supervisor-subordinate relationship, the weaker the positive effect of psychological resilience on deviant innovation. H4 is supported.

Table 5: Moderating effect

Path	Path coefficient	p	95% CI	99% CI
Psychological resilience to deviant innovation	0.578	0.000	[0.397, 0.759]	[0.340, 0.815]
Supervisor-subordinate relationship to deviant innovation	0.336	0.000	[0.248, 0.425]	[0.221, 0.452]
Interaction term to deviant innovation	-0.162	0.010	[-0.285, -0.039]	[-0.324, -0.001]

Note: N = 282. CI = confidence interval.

To examine the interaction more closely, simple slopes were plotted at one standard deviation above and below the mean of the supervisor-subordinate relationship. Figure 3 presents the result. When the supervisor-subordinate relationship was weak, psychological resilience had a strong positive effect on employee deviant innovation (beta = 0.740, $p < 0.001$). When the supervisor-subordinate relationship was strong, that positive association weakened (beta = 0.416, $p < 0.001$). The difference between the two slopes was significant (beta = -0.324, $p < 0.05$).

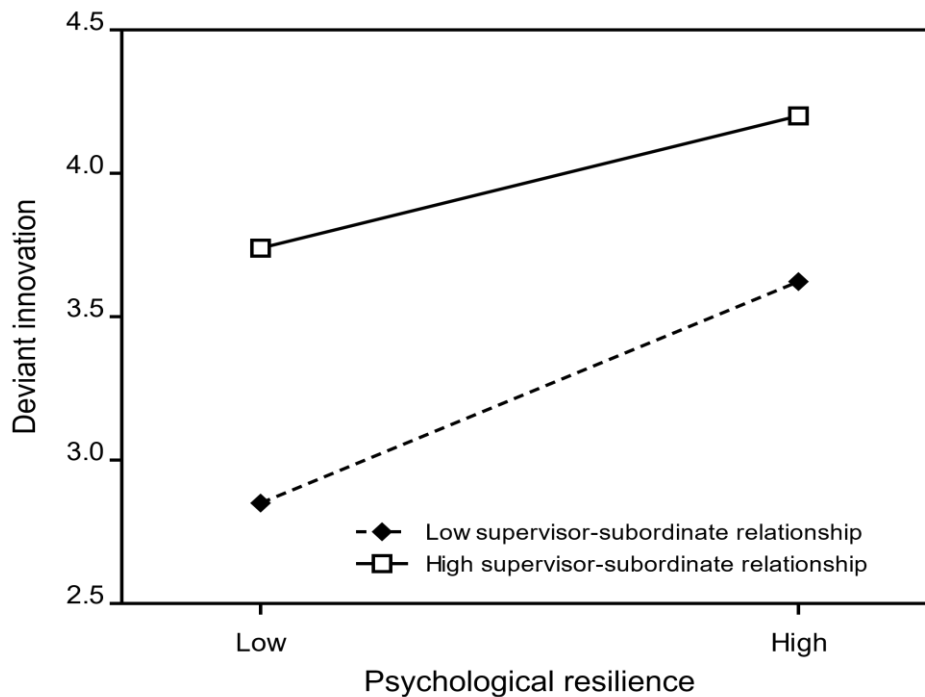


Figure 3: The relationship between psychological resilience and deviant innovation at different levels of the supervisor-subordinate relationship

Conclusions and Discussion

Conclusions

Working from conservation of resources theory, this study examined the effect of flexible human resource management on employee deviant innovation and tested the mediating role of psychological resilience and the moderating role of the supervisor-subordinate relationship. Both dimensions of flexible human resource management were positively related to employee deviant innovation. Psychological resilience mediated both relationships. The supervisor-subordinate relationship negatively moderated the relationship between psychological resilience and employee deviant innovation.

Theoretical contributions

First, this study enriches research on the antecedents of deviant innovation. Existing work has concentrated on leadership styles such as authentic and humble leadership, on personality traits such as proactive personality, and on organizational climate. By starting from the human resource management system, this paper extends research on the antecedents of employee deviant innovation and offers a different perspective on the mechanisms that trigger it. Flexible management practices now play an important role in firms, and by treating flexible human resource management as the independent variable, this study broadens the set of known antecedents from a new angle.

Second, this study identifies psychological resilience as the transmission mechanism between flexible human resource management and employee deviant innovation. Prior work has examined the influence of leader, organizational, and individual factors on deviant innovation, and studies of individual factors have covered character, personality traits, values, and behavioral beliefs. The question of what inner drive makes employees willing to violate norms in pursuit of an idea has received less attention. Psychological resilience reflects an individual's ability to maintain a healthy state of mind when facing setbacks or pressure, and it is a key personal resource that can be developed over time. The results show that flexible human resource management is positively related to psychological resilience, and that psychological resilience is in turn positively related to deviant innovation, which broadens the research perspective on resilience as a resource that converts organizational provision into unconventional innovative action.

Third, the moderating role of the supervisor-subordinate relationship shows that situational cues shape how employees use their personal resources. Leaders are a major source of employees' work resources, and treating the supervisor-subordinate relationship as a moderator therefore allows for a fuller account of employee behavior. The results corroborate the work of Lu et al. (2022) on the innovative behavior that follows partial treatment of insider and outsider subordinates: a strong supervisor-subordinate relationship does not invariably promote deviant innovation, and outsider subordinates may in fact turn to it more readily.

The results for the supervisor-subordinate relationship appear at first sight to point in two directions, since the relationship has a positive main effect on deviant innovation ($\beta = 0.336$) yet negatively moderates the link between psychological resilience and deviant innovation ($\beta = -0.162$). The two findings answer different questions and are consistent with conservation of resources theory. The main effect concerns the overall supply of resources: employees who enjoy a strong relationship with their supervisor receive more support, more information, and more latitude, and this raises innovative activity in general. The interaction concerns how a personal resource is converted into a particular form of action. When the relationship is strong, legitimate channels for pursuing an idea are open, so resilient employees have little reason to spend their resources on a covert route, and resilience is expressed through sanctioned innovation instead. When the relationship is weak, those channels are closed, and resilience becomes the resource that allows an employee to pursue the idea anyway. Contextual and personal resources therefore act as partial substitutes: the marginal value of resilience for deviant innovation is highest precisely where relational resources are scarcest.

Practical implications

First, organizations should strengthen their flexible human resource management systems. Internal communication and coordination mechanisms need reinforcement, and cross-departmental collaboration platforms encourage exchange between units and promote the sharing of knowledge and experience, which broadens employees' knowledge base and lays a foundation for innovation. Management should set an example by advocating an open and inclusive culture, so that employees feel valued and become more willing to take part in innovation. Resource allocation should also be optimized: employees should be allowed to request the resources their projects require, within limits the organization finds acceptable, and incentive mechanisms should be designed to sustain their motivation. An environment that tolerates failure

reduces employees' fear of innovation, and support from leaders together with trust among colleagues gives employees a sense of psychological safety. Innovation outcomes should be evaluated regularly so that management strategies can be adjusted in time, and multiple feedback channels should be established to collect employees' views on the innovation process and on management practice.

Second, organizations should make full use of the influence of flexible human resource management on employee psychological resilience. Because resilience carries the effect of flexible human resource management on innovative behavior, strengthening resilience is an effective way to stimulate that behavior. Organizations can run dedicated workshops and training courses that teach employees strategies for coping with pressure and challenge. Management should work with employees to set goals that are challenging yet attainable, so that excessive pressure does not leave employees feeling defeated. Trial and error should be encouraged, and investment in lifelong learning will keep employees' knowledge current and their capacity for innovation alive. Leaders can lead by example, showing how to stay resilient and positive in the face of challenge.

Third, organizations should recognize the trend toward deviant innovation and see more in it than a violation of organizational norms, since it can also advance the development of the organization. Because deviant innovation may erode the efficiency of formal innovation control, it can unbalance the innovation project portfolio and delay officially designated projects. Managers must therefore strike a balance between encouraging employee initiative and regulating the intensity of deviance, so as to avoid innovation disorder.

Fourth, managers should attend to the distribution of relational resources within the team. The moderation result indicates that employees who stand outside a supervisor's close circle are the ones most likely to convert personal resilience into covert innovative activity. Where this happens repeatedly, it is a signal that legitimate channels for raising ideas are not equally accessible to everyone. Transparent criteria for allocating project resources, and review mechanisms that let ideas reach a decision maker without depending on the strength of a personal relationship, would allow more of this energy to surface through official routes.

Limitations and future research

First, the data are cross-sectional and all variables were reported by the same respondents, which prevents strong causal inference and leaves open the possibility of common method variance. Future research could use longitudinal designs and collect data from multiple sources, for example by pairing employee reports of resilience with supervisor or peer ratings of innovative behavior.

Second, this study used conservation of resources theory alone to explain the effect of flexible human resource management on employee deviant innovation. Explaining extra-role behavior solely from the perspective of resource conversion may be one-sided. Future work could draw on several theoretical lenses and multiple paths, and could examine flexible human resource management at the organizational level in relation to outcomes such as organizational citizenship behavior and organizational commitment.

Third, only the supervisor-subordinate relationship was examined as a moderator. Other contextual and individual factors may condition the relationship between psychological resilience and deviant innovation, and future research could test moderators such as organizational innovation climate, error management culture, or perceived organizational support.

Fourth, the sample was drawn entirely from firms in mainland China, and the supervisor-subordinate relationship as measured here is embedded in a cultural context in which informal ties carry particular weight in resource allocation. The direction of the moderating effect may therefore differ in settings where access to resources depends less on personal relationships. Replication in other cultural contexts, and comparative work across contexts, would establish how far these findings generalize.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data availability

Data will be made available on request.

Ethical approval

Not applicable

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