

A Review of Research on Employee Deviant Innovative Behavior

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Abstract: *In the era of knowledge economy, deviant innovation, as an unconventional innovation method, is increasingly appearing in organizations due to its dual attributes of legitimate ends and illegal means, which have attracted academic attention. This article summarizes the research results of domestic and foreign scholars on deviant innovation, clarifies the concept and connotation of deviant innovation, summarizes the measurement methods of deviant innovation, summarizes the antecedent and outcome variables of deviant innovation, proposes conclusions, and prospects for them.*

Keywords: *Deviant innovation, Mechanism, Research review, Innovation, Performance, Influence factor*

1. Introduction

Innovation is the source and driving force for sustained competition and diversified development of organizations in modern society, and it has always been a strongly advocated field for development by organizations and society. In the increasingly fierce market competition, innovation is an important support for the sustainable development of organizations and a backbone for improving their core competitiveness in the market. But in the field of innovation, there has always been a contradiction between innovation autonomy and innovation constraints^[1]. In the practice of innovation management, organizations often fall into the dilemma of innovation balance: it is necessary to give employees a certain degree of innovation autonomy to stimulate their innovation enthusiasm and generate more innovative ideas, while also paying attention to imposing appropriate constraints on employees to prevent their innovation results from being harmful to the organization's interests, and moving in the opposite direction of the organization's strategic goals^[2]. In order to achieve the goal of avoiding risks and achieving goals, organizations will design a strict process to screen and approve innovative ideas proposed by employees. Therefore, for employees, their innovation constraints are often higher than innovation autonomy, which will also affect their willingness to innovate. In the past, the academic community generally believed that innovative behavior and deviant behavior were the opposite. Deviant behaviors are considered non creative and have anti social and pro social characteristics^[3]. As deviant innovation increasingly appears in the public domain, the academic community has also conducted more in-depth research on it. Many studies have shown that the two opposing behaviors of innovation and deviance in people's subconscious are actually gradually merging. More and more employees exhibit deviant characteristics in their innovative behavior. It is generally believed that the phenomenon of employees disregarding leadership veto or violating organizational norms in innovative practices and engaging in innovative activities through informal channels is becoming increasingly common in organizations, and this innovative behavior is called deviant innovation. Some studies have also shown that in some organizations, fully standardized management saves organizational management costs and can constrain employee behavior. However, characteristics such as routine behavior and hierarchical rigidity within the organization can limit employees' innovative thinking and prevent their innovative behavior, which can actually reduce innovation performance. Therefore, some scholars in the academic community believe that organizations that blindly pursue highly unified management may have lower innovation management performance than those that allow certain deviant innovation behaviors. At present, research on the influencing factors and effects of deviant innovation behavior is relatively scattered, lacking a systematic and comprehensive understanding, and many studies are not based on the Chinese context. This study sorts out existing domestic and foreign literature, analyzes the concept and connotation, measurement, and mechanism of deviant innovation, summarizes the theme and preface of deviant innovation, in order to provide reference and reference for management work.

2. The concept and connotation of deviant innovation behavior

Deviant innovation has been an academic research topic for half a century. In 1967, Knight first proposed deviant innovation as an informal form of innovation, which inspired this research field. Subsequent scholars have conducted extensive explorations into this topic. From existing research literature, it can be seen that deviant innovation is a comprehensive concept. Although "deviant" and "innovation" may appear to be unrelated fields on the surface, merging together is a phenomenon that many organizations will encounter. Deviant behaviors refer to behaviors that violate the expected norms of the social environment^[4], relative to organizational norms and management. Norms include certain formal or informal rules, systems, and codes of conduct^[5], and obedience to management instructions is a basic normative requirement for most organizations and work^[6]. Innovation refers to the act of generating new ideas and implementing corresponding measures to achieve organizational goals^[7]. The result of innovation is usually the process of generating new products, technologies, and services that are beneficial to the development of society and organizations^[8]. At present, there are two English expressions for deviant innovation behavior: "bootlegging" and "creative deviation", which represent two different perspectives. The first type of viewpoint is represented by Augsdorfer's "bootlegging", which emphasizes autonomy, concealment, and grassroots nature. It believes that the purpose of deviant innovation is to improve organizational interests, and the means used are privately conducted by employees without the consent of higher-level leaders. The second type of viewpoint is represented by Mainemelis' "creative deviation", which emphasizes adversarial and deviant behavior. Adversarial behavior refers to employees who develop a rebellious and confrontational mentality when their superiors order them to terminate their deviant innovation behavior after they become aware of it; Partial rationality refers to the use of more covert means by union members to avoid further obstacles from higher-level leaders after they become aware of it. In fact, 'bootlegging' is a special case of 'creative deviation', while 'creative deviation' highlights the characteristic of deviance more. The main difference between these two perspectives lies in whether the organization or superior managers are already aware of employees' innovative ideas or behaviors. Although there are differences in the discourse between the two views, scholars generally believe that the purpose of employee deviant innovation is to bring benefits to the organization or improve organizational performance. The original intention of deviant innovation is innovation rather than deviance, but in the implementation process, deviant innovation behavior conflicts with organizational regulations and systems, lacking legitimacy. It is precisely because of this illegality and concealment that the pros and cons of deviant innovation, a private behavior, cannot be strictly distinguished, and it has also attracted continuous attention and research from the academic community.

In recent years, Chinese scholars have also begun to delve into the new concept of deviant innovation. Huang Wei^[1] leans towards the definition proposed by Augsdorfer and agrees with the viewpoint of "bootlegging". He further defines deviant innovation as an informal innovation activity carried out by employees privately, but this innovation activity is carried out when employees predict that it will benefit the organization. He believes that in Chinese organizational culture, the higher the power distance, the lower the confrontational behavior of employees towards leaders, so relatively speaking, deviant innovation with non disclosure and concealment is more universally applicable in Chinese contexts. In addition, Wang Hongyu et al.^[9] believe that Mainemelis' definition of emphasizing antagonism and deviation has more research value, that is, when employees' creativity or new ideas are rejected by higher-level managers, they still insist on using hidden and informal ways to implement their ideas, with the aim of bringing benefits to the organization or improving organizational performance through the results of their creative implementation. Jiang Yi^[10] integrated the concept of deviant innovation and believed that even if employees are hindered by organizational rules and regulations when engaging in deviant innovation, they are willing to violate organizational norms and generate deviant innovation in order to ultimately improve organizational interests. This definition highlights the characteristics of deviant innovation, including its organizational, informal, covert nature, and the possibility of violating rules and regulations when necessary, indicating that deviant innovation behavior is a positive innovation behavior with a legitimate purpose and illegal means.

In summary, this article defines deviant innovation as: deviant innovation is an innovative behavior that employees spontaneously engage in to improve organizational interests when organizational systems or management hinder employee innovation under objective conditions such as management not being informed and organizational innovation resources being scarce.

3. Measurement of deviant innovation behavior

Augsdorfer first elaborated on the concept of deviant innovation, but he preferred theoretical research and did not develop specific measurement scales. Starting from Criscuolo, deviant innovation has entered the empirical research stage. His team found through empirical research that deviant innovation behavior is an underground research and development phenomenon that occurs when employees explore their potential, and it is an out of character behavior. Based on this, they developed a measurement table containing 6 items. Later, scholars represented by Lin emphasized that the occurrence of deviant innovation behavior in organizations is accompanied by violations of organizational rules and regulations as well as higher-level orders. They believed that deviant innovation is completed within a certain period of time, beyond which employees will give up deviant innovation. Therefore, measurement is generally only meaningful within two months after the order to stop research and development is issued. Based on this, they developed a deviant innovation scale consisting of 9 items. The specific content of the two scales is shown in Table 1.

Table 1: Deviant Innovation Behavior Measurement Scale

category	project	content
Scales 1	Deviant and innovative behavior (Criscuolo et al.)	<ol style="list-style-type: none"> 1. I can flexibly arrange work tasks based on work plans, so as to explore new, potential and valuable business opportunities 2. In addition to the tasks assigned by the organization, my work plan leaves me with no more practice to do other work 3. In addition to the tasks assigned by the organization, my work plan leaves me with no more practice to do other work 4. I like to think of new ideas outside of my main job 5. I'm working on some sub-projects, which is something new for me to be exposed to 6. I take the initiative to spend time practicing some unofficial projects to enrich future official projects
Scales 2	Deviant and innovative behavior (Lin et al.)	<ol style="list-style-type: none"> 1. Although I did not have the permission of my superiors, I still continued to improve and enrich some new ideas 2. When I work, I often think about how to make ideas that have been rejected better 3. Although my superiors have explicitly asked me to stop developing certain projects, I continue to work on them 4. In addition to implementing ideas that have been approved by my superiors, I am also constantly collecting information and trying to improve those ideas that have been rejected by my superiors 5. I devote part of my working time to completing certain ideas that have been rejected by my superiors 6. So far, I have not given up on some ideas that have been rejected 7. I used my working hours to improve some ideas that had been rejected 8. Although some ideas have been rejected by my superiors, I am still improving them 9. I use my personal work time and resources to continue working on ideas that have been rejected

At present, the scale for measuring deviant innovation is mainly developed by Western scholars based on Western contexts, and strictly speaking, it is not applicable to Chinese contexts. Research on deviant innovation in China has only begun in the past two years, and many studies have also drawn on existing Western achievements. For example, Chen Wuyang et al. ^[11] directly used the "creative deviation" scale developed by Hong Kong scholar Lin et al., while Huang Wei et al. ^[1] used the "bootlegging" scale developed by Criscuolo et al. when measuring deviant innovation behavior. Due to cultural differences between China and the West, Chinese scholars have found that many of the measurement scales studied in Western contexts often exhibit a phenomenon of "acclimatization" in the context of Chinese Confucian culture. Therefore, scholars in China are constantly trying to develop a set of deviant innovation behavior measurement scales that are more suitable for local situations. For example, Zou Chunlong ^[12] developed a scale for deviant innovation in the context of Confucian

culture based on Chinese cultural scenarios.

3.1. Antecedents

3.1.1. Organizational variables

During the development period, organizations attach importance to diversified development and promote the development concept of "letting a hundred flowers bloom". However, although the procedural management model has greatly improved the operational efficiency of the organization and reduced the difficulty of management, it also greatly hinders the innovation efficiency of the organization, which is also the trigger for deviant innovation behavior in the organization. The existing research on the relationship between deviant innovation and organizations is conducted from three aspects: resource scarcity, organizational innovation atmosphere, and human resource management practices. The structural tension of resources is a dilemma that every organization cannot escape. In open organizations, the limited availability of organizational resources can lead to the emergence of deviant innovation behavior^[13]. When employees notice a shortage of organizational resources, they will continue to innovate activities by leveraging their own resources. For example, viewing work embeddedness as a tool resource can provide resource supply and work support for knowledge-based employees to alleviate the dilemma of resource scarcity and activate the intrinsic motivation for deviant innovation and sustained innovation^[14]. Similarly, organizations with an innovative atmosphere can stimulate employees' deviant innovative behavior, which Wang Hongyu^[16] believes is achieved through a sense of innovative self-efficacy. In the study of organizational innovation atmosphere, it was found that if an organization can connect employees' work content with their interests, create a good organizational innovation atmosphere, and achieve a sense of achievement in interests, it can trigger employees' deviant innovation mechanism; From the perspective of human resource management practices - performance evaluation, Menhe et al. found that different performance evaluation goals in organizations have a significant impact on employee behavior, and evaluative and developmental performance evaluations can have an impact on employee deviant innovation^[15].

3.1.2. Leadership variables

Lin et al.^[13] explored the impact of leadership variables on employees' deviant innovation from the perspective of leadership feedback. Through empirical research, they found that in organizations, employees' deviant innovation behavior is detected by superiors, resulting in two outcomes. One way is for leaders to choose to forgive their employees and ignore this behavior but prohibit them from continuing to innovate. At this point, employees may voluntarily terminate their deviant innovative behavior out of gratitude or fear of being discovered again. Another result is that even after being ordered by superiors to prohibit innovation, employees still engage in deviant innovation behavior regardless of the cost invested. The leadership style of a leader can also have an impact on employees' deviant innovative behavior. Scholars have proven that differential and inclusive leadership styles can promote employees to engage in deviant innovation and improve organizational innovation performance. In the face of deviant innovation, some leaders may consider encouraging and rewarding employees for their organizational benefits. At this point, leaders will grant employees more autonomy in innovation and even try to transform deviant innovation into standardized innovation. Other employees in the organization will follow suit and form a virtuous cycle within the organization. Over time, deviant innovation behavior in the organization will continue to increase. On the contrary, leaders with a strong desire for control may believe that employees' deviant innovation challenges their authority. In order to maintain the authority of the organization and their own authority over employees, they will adopt various punitive measures to deter employees and prevent their deviant innovation behavior. But it is also possible to have the opposite effect, where employees who are in a rebellious mentality will more covertly engage in deviant innovation, which enhances their motivation for deviant innovation. In some cases, leaders may show neither support nor strong support for employees' deviant innovation behavior, but may not provide resources or verbal support to oppose adopting a neglect strategy. Employees may choose to continue deviant innovation or terminate deviant innovation behavior depending on the situation. Some leaders may wait and see after discovering that employees have engaged in deviant innovation, and if they discover that the results of deviant innovation may be beneficial to the organization, they will provide more resources to employees, making innovation behavior legal and public; Once it is discovered that the harm brought by deviant innovation behavior outweighs the benefit, punitive measures will be taken to prevent employees from continuing or completely ignore their deviant innovation behavior. The utilitarian attitude of leaders can weaken the effectiveness of deviant innovation.

3.1.3. Individual variables

Augsdorfer was the first to study deviant innovation behavior at the individual level and focused on the impact of individual characteristics on deviant innovation. Later, Augsdorfer delved deeper into the characteristics of deviant innovators through psychological measurement methods, and used the research results to achieve the scientific identification of deviant innovators. He proposed that deviant innovators possess characteristics such as rapid response, non conservative, critical thinking, high achievement motivation, and workaholism. However, Augsdorfer's research only focuses on individual personality traits and temporary behaviors, and cannot explain individual characteristics and underlying motivations. Existing research on individual characteristics mainly focuses on personality traits, workplace status, regulatory focus in the workplace, and employee work values; Domestic scholars have also explored personality traits, such as finding that proactive personality has a positive impact on deviant innovation behavior, and more creative individuals value innovation outcomes more and are not bound by organizational rules. Wang Chaohui ^[16] believes that excessive sense of qualification brings about personal conflicts, which stimulate paradoxical thinking and lead to employees' deviant innovative behaviors; Research on the relationship between work autonomy and deviant innovation has found that work autonomy is a prerequisite for deviant innovation to occur, and knowledge workers' intrinsic motivation is activated to exhibit positive work behavior; Wang Hongyu ^[17] found that innovative self-efficacy can explain the organizational innovation atmosphere and induce the emergence of deviant innovation. In subsequent research, it was proposed that factors such as motivation and effectiveness cannot fully explain the reasons for deviant innovation, and a sense of power may be one of the reasons for deviant innovation. Later, some scholars proposed that behavioral attitude is an assessment of an individual's liking or dislike for adopting a certain behavior, and employees' attitude towards deviant innovation is an important factor in predicting deviant innovation intention. In existing research, factors that affect deviant innovation attitudes include personal traits and values. Research has shown that the impact of personal traits on deviant innovation includes three aspects. The first aspect is proactive personality. Employees with high proactive personality have a strong willingness to solve problems on their own, and out of confidence in their abilities, they often engage in deviant innovation in private. The second aspect is personality traits. Most of these employees are lively, outgoing, quick thinking, and more agile in handling things. The rules and regulations of the organization sometimes limit their speed of innovation, so they choose to deviate from the norm and innovate quickly to achieve their desired goals. The third aspect is creativity. Employees with strong creativity have a strong willingness and ability to innovate, but their divergent and critical thinking are more active. The organization's innovation activities cannot keep up with their pace, so they may choose to violate organizational norms for innovation activities. Li Xiaoyuan et al. ^[18] empirically tested the positive promoting effect of proactive personality on deviant innovation based on self-determination theory. Meanwhile, some scholars have proposed that employees with stronger creativity have a higher sense of self-efficacy and achievement motivation than ordinary employees, and such employees are also more likely to engage in deviant innovation ^[19].

3.2. Result variables

3.2.1. The impact of deviant innovation on individuals

Although deviant innovation is a unconventional means, through this approach, employees can largely solve problems encountered in the work process and improve innovation performance through hidden and non-public deviant innovation when lacking organizational resources or unable to receive support from superiors for a short period of time. Specifically, deviant innovation can have an impact on employees from three aspects ^[20]. One is to enhance employees' sense of identification with innovative projects. The process of employee deviant innovation, from the generation of ideas to the formation of creativity, is personally explored by employees, with a strong personal color and also something they put in their own efforts to achieve from the bottom of their hearts. Therefore, they have a strong sense of identification with innovative projects. Compared with innovation activities initiated within the organization, the root cause of deviant innovation brings deeper identification to employees who engage in innovative behavior ^[21]; People are emotional creatures who have a natural sense of identification with what they have personally created. When they discover the shortcomings of what they have personally created, they are also willing to invest more time and energy in transforming and improving to achieve perfection ^[22]. Therefore, when reporting to superiors, one not only becomes more proficient but also more persuasive. The second is to improve the exploration ability of employees. Huang Wei, Xiang Guopeng, and others ^[1] believe that employees who implement deviant innovation have a lower sense of obligation in terms of compliance with regulations and relationship

maintenance, and are therefore more flexible in dealing with problems and obstacles, demonstrating a stronger willingness to explore and innovate. The third is to enable employees to learn how to effectively integrate resources, not only to maximize the utilization of integrated resources, but also to make reasonable use of some scattered resources. The overall resources within the organization are limited, and are even more limited when allocated to individual employees. Additionally, there is a strict review process for resource allocation within the organization, which leads to some scattered resources being unable to be fully utilized and wasted. However, deviant innovation itself has concealment and non disclosure, so when employees engage in deviant innovation, they will automatically skip the review process and do not go through a strict approval process. Both integrated and scattered resources are one of the resources for deviant innovation. In order to ensure the continuity of innovation implementation, employees will make greater efforts to explore forgotten or hidden resources in the organization, so that resources can be fully utilized. Practice has shown that using local materials is more in line with the needs of innovation activities and can better improve employee innovation performance.

In addition to positive impacts, deviant innovation can also have a certain degree of negative impact on employees. When deviant innovation is discovered by leaders, they are likely to anticipate the risks that deviant innovation brings to the organization in advance, and then impose penalties on employees, reclaim their independent innovation and research rights, and even take measures such as salary reduction, demotion, and dismissal. In organizations with strict management, clear hierarchy, and mature development, the negative impact of employees' deviant innovative behavior discovered by leaders may be greater.

3.2.2. The impact of deviant innovation on organizations

The impact of deviant innovation on organizations mainly lies in two aspects: team innovation performance and organizational innovation ability. Augsdorfer believes that deviant innovation will promote the formation and increase of incremental innovation within organizations. Lin et al. [14] believe that the starting point of deviant innovation is altruism and pro organizational nature, with the ultimate goal of bringing benefits and corresponding performance to the organization. Research by Wu Yingxuan and others has shown that deviant innovation behavior will increasingly appear in organizations in the new era, which is the behavior of employees that organizations need. Deviant innovation can not only improve the innovation ability of organizations, but also improve their innovation performance, thereby enabling organizations to gain more benefits and enhance their core competitiveness in the market. Knight [23] believes that deviant innovation will increase radical innovation within the organization. Song Yuan et al. found a positive correlation between employee deviant innovation and organizational innovation ability. On the one hand, deviant innovation can greatly increase the supply of creativity for organizations and teams. By screening a large number of creative ideas, organizations can discover higher quality, more competitive creative ideas that can bring more benefits to the organization, open up informal innovation paths outside of formal innovation channels, and improve innovation efficiency and success rate, laying the foundation for improving organizational performance; On the other hand, the creative ideas of deviant innovation are more radical and bold, which can help organizations explore new innovative ideas, expand the creative boundaries between organizations and teams, accumulate innovation experience, and promote the improvement of organizational innovation ability and team innovation performance. There are also views that deviant innovation has good results in the actual operation process and is effective for the interests of the organization, but overall, it fundamentally violates the authority of the organization. Therefore, even if the starting point and outcome of employees' deviant innovative behavior are good, in the eyes of the organization, employees' behavior will ultimately have a negative impact on the organization. Obedience to management is a fundamental requirement for employees in all organizations, while deviance is a challenge for employees to the authority of the organization. Even if employees have no intention of challenging the authority of the leader, their actual behavior still reduces the leader's expectations for employees to implement organizational regulations in a standardized manner, believing that the employee's research and development process has become beyond the control of management, and may even trigger other employees' counter productive behavior, affecting the overall performance of the organization.

4. Conclusions

Employee deviant innovation behavior, as a cutting-edge concept, although it was proposed as early as the 1960s, it did not receive widespread attention from scholars until 30 years later, and it was not

until the past two years that it became a research topic of focus and exploration in multiple disciplines such as human resource management and organizational behavior. Deviant innovation can reflect both positive and negative effects. If an organization wants to grow and develop, it should not only recognize the negative effects of employees' deviant innovative behavior, but also recognize its positive effects and make positive changes to employees' behavior. Firstly, managers should have a rational and objective view of employees' deviant innovation behavior, and approach employees' deviant innovation behavior with the correct attitude. After discovering that employees engage in deviant innovation in private, managers should not only see that employees are disrupting the organization's rules and regulations and standardized processes, but also see the benefits, performance improvement, and breakthrough innovation that deviant innovation brings to the organization as a whole. Secondly, a leader's leadership style can have a significant impact on employee behavior, and can even determine employee behavior. Therefore, leaders should be good at discovering the shining points of employees when engaging in deviant innovative behaviors, and avoid conflicts with employees. When employees feel the tolerance of their leaders, they may develop higher innovation motivation, which in turn leads to more personal innovation performance. Once again, leaders need to create a good organizational innovation atmosphere. Deviant innovation is essentially non-traditional innovation, which may conflict and conflict with leaders during the implementation process. At this point, leaders should take a comprehensive view of the advantages and disadvantages of deviant innovation, create a good innovation atmosphere, rather than sweeping it all away. Finally, leaders should give employees sufficient innovation autonomy. Professional people do professional things, and leaders only need to lend a helping hand in a timely manner when employees need help. There is no need to take it all in one's own hands, nor should they presumptuously guide the country. Providing necessary resource support can better enhance employees' innovation motivation.

Finally, there are several points that need to be clarified regarding the future prospects of employee deviant innovation. Firstly, a consensus needs to be formed on the connotation and measurement methods of deviant innovation. Scholars still have different understandings of the connotation of deviant innovation, and their measurement methods also have different focuses, making it difficult to achieve accurate research on deviant innovation. Further improvement and correction are needed. Secondly, the existing research sample selection is mostly employees of technology intensive enterprises, and empirical studies can mostly confirm the positive relationship between deviant innovation and innovation performance. However, whether this conclusion is valid in other industries and organizations needs further testing. Finally, the development of scales for employee deviant innovation in the Chinese context is still insufficient. Scholars mostly use scales developed by foreign scholars for validation analysis. Although the reliability and validity of the scales have been confirmed, based on the differences in the development environment of the scales, it is necessary to conduct research on scale development in localized contexts.

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