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An Investigation into the Internal Mechanisms of Shifting Attention to Coal Mine Safety in China: An Explanatory Framework Based on the Discontinuous Equilibrium Model

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ABSTRACT

This study examines shifts in China's central government attention to coal mine safety (2006 – 2025) through an adapted Punctuated Equilibrium Theory framework. Analysis of policy documents reveals alternating equilibrium phases—"regulatory dominance" (2006 – 2012), "dual-track" (2016 – 2019), and "long-term development" (2021 – 2025)—and punctuation phases—"adjustment and transformation" (2013 – 2015) and "transformative transition" (2020). Punctuations are driven by macro-level strategic realignments (e.g., supply-side reform, intelligent transformation) and focal accidents. Findings indicate that national development narratives fundamentally drive policy punctuation in China, with focal events accelerating policy monopoly breakdown. Each equilibrium-punctuation cycle represents iterative governance upgrading rather than simple repetition, contributing to punctuated equilibrium theory's localization and understanding of nonlinear policy change in coal mine safety.

KEYWORDS

Coal mine safety; Punctuated equilibrium theory; Government attention; Policy evolution; Macro-level value orientation; Focal events; China

1 Introduction

As one of the primary energy sources underpinning China's national economic development, coal holds a crucial strategic and foundational position in national energy security and socioeconomic progress. Coal mine safety, which safeguards coal production, not only concerns the health and well-being of individual miners and their families but also directly impacts stable energy supply and social harmony and stability. It represents a vital practice in implementing the "Comprehensive National Security Outlook."For a long time, the state has attached great importance to coal mine safety, and the situation of production safety has continued to improve steadily. However, major and particularly serious accidents still occur from time to time. Against this backdrop, exploring the internal logic of the central government's attention shift has become key to understanding China's coal mine safety governance. Yet existing academic research has insufficiently addressed this issue. First, within the field of government attention studies, most analyses focus on local government behavior and responses, while dynamic tracking of central government attention and exploration of its macro-level logic remain relatively rare.Second, government attention under the discontinuity-equilibrium framework is often treated merely as a tool for measuring actor preferences. Most studies emphasize describing where government attention "focuses" —that is, the explicit shifts in policy agendas—while lacking in-depth analysis of the underlying mechanisms driving why and how attention undergoes phased leaps or incremental adjustments.Moreover, while policy research in coal mine safety has accumulated some insights, it predominantly centers on international experience and fiscal-tax policies, with limited in-depth analysis of the intrinsic mechanisms driving discontinuous equilibrium shifts in government attention. Based on this, this paper aims to reconstruct the discontinuity-equilibrium theoretical model. By analyzing central government policy texts related to coal mine safety from 2006 to 2025, it identifies the equilibrium and discontinuity periods in China's coal mine safety attention over the past two decades. It delves into the underlying driving factors and operational mechanisms, exploring the intrinsic dynamics of these shifts.

2 Theoretical Foundation

The punctuated equilibrium theory originated in the field of paleontology.In 1972, American scholars Niles Eldredge and Stephen Jay Gould challenged traditional gradualist evolutionary views through fossil record analysis. They proposed that biological evolution remains in a state of relative equilibrium over long periods, while new species emerge explosively within short timeframes. In the early 1990s, Frank R. Baumgartner and Bryan D. Jones creatively applied this theoretical framework to public policy research . They translated the concepts of "punctuated" and "equilibrium" from biological evolution into a description of policy change dynamics, challenging the long-dominant gradualist perspective in policy science. As a crucial framework for interpreting non-linear policy change, the Discontinuity-Equilibrium Theory rapidly became a mainstream paradigm in Western public policy research after its introduction. It has been extensively validated and expanded across multiple domains, including environmental policy, budgetary policy, and legal policy.

Within discontinuity-equilibrium policy research, several core concepts are frequently referenced. The policy field refers to organizations possessing authority and power in the policymaking process, primarily involving government agencies, interest groups, and social organizations. The policy landscape denotes the perceptions and attitudes of target

groups, the general public, and the media toward enacted policies—that is, how a policy issue is discussed and understood by the public and media.Policy monopoly refers to a closed, stable policy structure system maintained by the policy subsystem. The theoretical logic of discontinuity-equilibrium can be summarized as follows: After decision-making by actors within the policy field, policy outcomes enter the public sphere, forming a policy landscape. Under a positive policy landscape, policies often gain broad acceptance, ensuring smooth implementation and significant effectiveness; a negative policy landscape manifests as public skepticism, implementation bottlenecks, and diminished outcomes. A positive policy landscape fosters policy monopoly, maintaining the status quo within the policy field. Government attention becomes entrenched in established trajectories, ushering the policy into an equilibrium phase. A negative policy landscape triggers intense disruption. Once the policy monopoly is broken, it leads to the dissolution of the original monopoly, triggering a dramatic reconfiguration of attention and rapid succession of policy agendas, propelling the policy into an interruption phase.

3 Analytical Framework

The Discontinuity-Equilibrium Theory provides a robust analytical framework for explaining both the long-term stability and short-term abrupt changes in governmental attention within the policy process. During equilibrium phases, dominant policy narratives and closed policy fields mutually reinforce each other, sustaining incremental policy adjustments. Conversely, when new policy narratives successfully challenge established perceptions or policy fields open to new participants, abrupt policy discontinuities may occur. (Model diagram based on prior research)

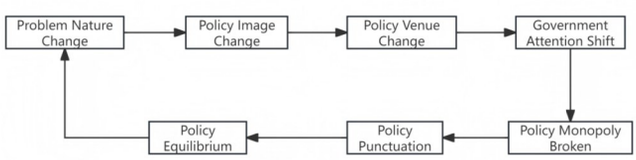


Figure 1 Attention Transition Model from the Discontinuity-Equilibrium Perspective

As discontinuity-equilibrium theory emerged within Western political ecosystems characterized by multiparty competition and checks-and-balances systems, China's distinct political system necessitates adaptation for domestic policy analysis. Domestic scholars who adopted this theory have consistently emphasized localizing it through modifications aligned with China's policy-making characteristics and practical validation. This paper therefore examines and refines its driving mechanisms through a localized lens.

(1) Significant differences exist in the policy arena. Western theories regard changes in formal political structures—such as party alternation and shifts in parliamentary seats—as key drivers for opening and restructuring the policy arena, positioning them as crucial elements triggering discontinuity-equilibrium. In China, the centralized and unified leadership of the Party Central Committee ensures long-term stability in political structures and core decision-making arenas, presenting marked differences from Western policy change mechanisms.

(2) Macro-level value orientations constitute a crucial factor in shifting governmental attention. Policy formulation in China is deeply embedded within national development strategies and value hierarchies, where top-down design exerts dominant influence over policy creation and program design. When the macro-framework of national development undergoes transformation, governmental attention shifts accordingly. This fundamental structural realignment serves as a key catalyst for policy discontinuity.

(3) The emergence of focal events also triggers shifts in governmental attention. Such events typically exhibit rapid emergence, high visibility, and strong symbolic significance, enabling them to swiftly disrupt existing policy agendas. This forces the decision-making system to reassess the alignment between policy formulation and practical challenges, thereby propelling policy discontinuity.

Based on this, this paper reconstructs a localized analytical framework (Figure 1) by integrating the institutional context of China's policy process and the practical characteristics of the coal mine safety sector with the classic discontinuity-equilibrium theory. This framework aims to systematically analyze the internal logic and operational mechanisms of policy evolution in China's central government coal mine safety policies.

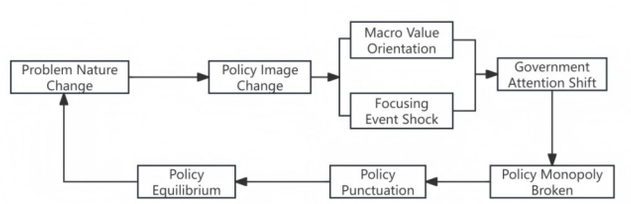


Figure 2 Modified Attention Shift Model from a Discontinuity-Equilibrium Perspective

When social problems emerge, policy actors propose policy resolutions addressing specific issues. Upon gaining broad societal acceptance, a positive policy landscape forms, leading to policy monopoly. This phase is characterized by stable government attention, smooth policy implementation, and effective outcomes, marking the policy equilibrium period.

As society advances, new forms in the public sphere emerge rapidly, and the nature of social problems evolves. Tensions between the existing policy landscape and real-world governance demands accumulate continuously, gradually diminishing the explanatory power of the prevailing policy framework. Consequently, the policy landscape begins to shift. Benefiting from the superiority of its political system, China's policy evolution often aligns with its macro-narrative framework. Macro-level value orientations, such as those set at the national top level, provide crucial traction for shifting government attention and reconstructing policies. The social impact of major focal events, acting as powerful external shocks, plays a crucial role in triggering shifts in government attention and accelerating the dissolution of policy monopolies, thereby driving the emergence of policy discontinuities.

Over time, major reform measures introduced during discontinuity periods gradually become institutionalized and normalized, shaping new policy landscapes and governance arrangements. Subsequently, government attention stabilizes again, entering a new policy equilibrium cycle until disrupted by fresh triggers.

The "equilibrium-discontinuity-re-equilibrium" evolutionary process reflects the nonlinear nature of governmental attention, oscillating between long-term stability and short-term abrupt shifts. This dynamic transformation is not a simple repetitive cycle but rather a process through which the policy system continuously adjusts its cognition and optimizes governance effectiveness in response to complex challenges.

4 Discontinuity-Equilibrium Analysis: Evolution of the Central Government's Attention to Coal Mine Safety

This study employs a sample of normative documents—including laws, regulations, policies, and notices—related to coal mine safety issued or forwarded by the central government between 2006 and 2025. Utilizing a reconstructed discontinuity-equilibrium theoretical framework, it systematically analyzes the intrinsic logic and driving mechanisms behind shifts in the central government's attention within this domain.

4.1 The Equilibrium Period Under the "Regulatory Dominance" Paradigm (2006–2012)

From 2006 to 2012, the central government's attention to coal mine safety focused on strengthening supervision and administrative accountability. The primary objective during this period was to curb the frequent occurrence of major and particularly serious accidents. Through administrative directives, targeted campaigns were launched to enforce special rectifications and solidify primary responsibility, shaping a policy landscape of intensified supervision under a high-pressure deterrence scenario. In 2006, the State Council General Office issued the "Opinions on Strengthening Management of the Coal Industry", aiming to solidify the foundation of production safety at the industry management level. It emphasized further clarifying the responsibilities of various government functional departments and strengthening the implementation of responsibilities within the coal industry. In 2007, the Coal Mine Work Safety "Eleventh Five-Year Plan" provided constructive guidance for safe coal mine development. It set out a series of planning objectives, including reducing accident and fatality rates, continuing to control the number of small coal mines, and establishing a relatively comprehensive regulatory and supervision system.

During this period, central coal mine safety policies were closely coordinated and implemented in a tiered manner, exhibiting distinct characteristics of gradual adjustment. Together, they constructed a policy monopoly system centered on law enforcement and supervision, with the policy system maintaining a stable and balanced state.

4.2 The Discontinuity Period Under the "Adjustment and Transformation" Paradigm (2013–2015)

From 2013 to 2015, the central government's focus on coal mine safety underwent a significant discontinuous leap, with policy efforts shifting toward paradigm shifts and structural adjustments.

As the energy sector continues to evolve, the coal industry—a representative of traditional manufacturing—faces increasingly prominent issues stemming from its extensive development model, such as structural overcapacity. During this period, China's top-level development strategy underwent profound changes, with "capacity reduction" and "supply-side structural reform" becoming key components of national economic development, signaling a shift in the macro-level orientation of policy formulation. The 2013 release of the "Opinions on Promoting the Stable Operation of the Coal Industry" demonstrated the deep alignment between coal mine safety concerns and broader narratives of healthy national economic operation and energy structure optimization. At this juncture, the explanatory power of the existing policy framework continued to diminish, as government attention broke through old paradigms, challenging the established policy monopoly system.

Simultaneously, a series of major accidents created a strong negative policy landscape, serving as another driving force to disrupt the policy equilibrium. In 2013, the Babao Coal Mine in Jilin Province experienced an exceptionally severe gas explosion that claimed 36 lives. What made the incident particularly grave was the company's concealment of seven fatalities to evade responsibility. Furthermore, despite a provincial government order prohibiting underground

operations, the company illegally organized personnel to work in violation of regulations, triggering another explosion that killed 17 more people. The outbreak of these focal incidents drew widespread attention and prompted intense reflection among policymakers, the public, and the media. It became clear that relying solely on administrative oversight and post-incident emergency response mechanisms was insufficient to address existing realities, severely undermining the original policy landscape. The impact of these focal incidents propelled the government's focus toward implementing a paradigm of comprehensive safety management.

4.3 The Equilibrium Period Under a "Dual-Track Approach" (2016–2019)

From 2016 to 2019, the central government's focus on coal mine safety entered a new phase of policy equilibrium. The safety concepts established during the preceding discontinuity period were progressively institutionalized, standardized, and refined. The policy system stabilized under a coordinated framework of "capacity reduction" and "safety assurance." On one hand, supply-side structural reforms deepened, with significant attention directed toward eliminating and resolving excess capacity.Resolving excess capacity emerged as a crucial measure to enhance industry safety and became key to driving positive shifts in the safety production landscape. Simultaneously, coal mine safety governance focused intensely on preventing major accidents and ensuring compliance with safety regulations. Policy priorities now included learning from past safety incidents, standardizing safety production responsibilities, and strengthening miner safety protections. Policy formulation further refined and implemented comprehensive safety standards.

Within this new, systematically consolidated policy framework, the policy landscape exhibits a dual-track approach of advancing both high-quality development and high-level safety. Government attention remains steadfastly focused on optimizing industrial structure and enhancing production safety.

4.4 The Discontinuity Period Under the "Transformative Transition" Framework (2020)

In 2020, central attention to coal mine safety underwent a new discontinuous leap, breaking the previous policy monopoly and shifting the focus to the "intelligent" domain.

With the gradual advancement of modern technologies, the macro-narrative framework of intelligent transformation gained prominence. The intelligent governance upgrade of coal mine safety became a crucial driver for development quality and competitiveness. Simultaneously, under dual pressures from a complex external environment and the imperative for autonomous control over energy security, enhancing the resilience of the energy supply chain evolved from a long-term vision into a necessary measure responding to immediate demands. Against this backdrop, the existing policy system faced challenges, and the intelligent transformation of coal mine safety governance emerged as the dominant policy landscape under the new circumstances.

In early 2020, the Guiding Opinions on Accelerating the Intelligent Development of Coal Mines, jointly issued by eight ministries including the National Development and Reform Commission, the National Energy Administration, and the Ministry of Emergency Management, served as the programmatic document spearheading this paradigm shift.It explicitly charts the course for integrating intelligent technologies with the coal industry, reflecting a government shift in focus toward coal mine intelligence. This breakthrough transcends outdated policy monopolies, broadens established pathways for coal mine safety development, and marks another discontinuous evolution in policy evolution.

4.5 The Equilibrium Phase Under the "Long-Term Development" Vision (2021–2025)

From 2021 to 2025, the central government's focus on coal mine safety transitioned from "reform initiatives" to "long-term institutionalization," stabilizing under the core vision of "intelligent application and enhanced safety governance." This marked the onset of a new policy equilibrium phase.During this period, the transformative blueprint established in the preceding discontinuity phase rapidly evolved into normalized institutional norms. The policy system's focus shifted toward scaling up intelligent construction implementation and deepening the effectiveness of safety governance, shaping a robust and stable policy monopoly structure.

To standardize the intelligent transformation of coal mines, the state formulated the "Guidelines for Intelligent Coal Mine Construction (2021 Edition)" in 2021. During this phase, multiple regulatory documents collectively emphasized the application and promotion of advanced technologies in coal mine safety, providing policy guidance for the industry's intelligent development and fostering a favorable environment for such advancement. Government attention was thus positioned within the positive framework of intelligent construction.

Concurrently, the refinement and systematization of safety governance emerged as another focal point of governmental attention, propelling the modernization of coal mine safety management.The newly revised Work Safety Law of the People's Republic of China solidified the legal foundation for coal mine safety governance. Risk prevention and control policies targeted major hazards such as gas, fire, water damage, and rock bursts, exhibiting characteristics of precision-focused policy implementation. Regulatory mechanisms achieved multi-level, multidimensional innovation through measures like refining whistleblower reward details and strengthening safety publicity and education.

Throughout this phase, government attention remained consistently centered on the policy vision of "long-term sustainable development," exhibiting characteristics of long-term, gradual, and stable equilibrium.

5 Research Implications

This study examines central government coal mine safety policies from 2006 to 2025. Building upon existing research, it adapts the discontinuity-equilibrium theoretical model as a foundational framework to analyze the underlying mechanisms of shifting central government attention toward coal mine safety. Findings reveal: First, central government attention exhibits a distinct nonlinear trajectory of discontinuity-equilibrium shifts. Second, in China's coal mine safety sector, the macro-level value orientation of national development strategies serves as the fundamental driving force behind discontinuous shifts in attention, while focal events such as major accidents accelerate the dissolution of policy monopolies. Third, each new round of discontinuity-equilibrium alternation represents not a simple cyclical repetition but a dynamically evolving iterative upgrade, promoting continuous optimization of coal mine safety governance.

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