Motivational Compensation: A The

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Abstract

[Objective] This study aims to construct a theoretical model of "motivational compensation" to explain the psychological mechanisms underlying the phenomenon of "hollow heart disease" among college students. [Method] Based on self-determination theory, it is proposed that when external pressure exceeds the regulatory threshold of the psychological system, a motivational compensation response is triggered, whereby intrinsic motivation is replaced by extrinsic motivation, leading to functional alienation and resulting in psychological depletion. [Results] The model describes a continuous process of intrinsic motivation reconstruction, which can account for the manifestation of hollow heart disease and its self-sustaining nature, and provides a theoretical framework for assessing students' psychological status, improving the educational environment, and designing "de-compensation" interventions. [Limitations] The limitation of this study lies in the fact that the model is still at the stage of theoretical deduction, with its empirical validity yet to be tested, and that it offers insufficient discussion of individual differences and the concretization of educational interventions. [Conclusion] This model provides a mechanistic analytical tool for understanding and addressing hollow heart disease, and holds both theoretical and practical value.

Full Text

Motivation Compensation: A Theoretical Model Revealing the Dynamic Formation Process of "Hollow Disease"

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Abstract
[Objective] This study aims to construct a theoretical model of "motivation compensation" to explain the psychological mechanism underlying the "hollow

disease" phenomenon among university students. [**Methods**] Based on Self-Determination Theory, we propose that when external pressure exceeds the regulatory threshold of the psychological system, it triggers a motivation compensation response, leading to internal motivation being replaced by external motivation, which induces functional alienation and causes psychological depletion. [**Results**] This model describes the continuous process of intrinsic motivation reconfiguration, can explain the hollow disease phenomenon and its self-sustaining nature, and provides a theoretical framework for assessing student psychological states, improving educational environments, and designing "decompensation" interventions. [**Limitations**] The limitations of this study lie in that the model remains a theoretical deduction whose empirical validity needs to be tested, and that it lacks sufficient exploration of individual differences and specific educational interventions. [**Conclusions**] This model provides a mechanism-based analytical tool for understanding and addressing "hollow disease," possessing both theoretical and practical value.

Keywords: motivation compensation; hollow disease; dynamic formation; theoretical model

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The *Education Strong Country Construction Plan Outline (2024-2035)* proposes that China should advance from a major education country to a powerful education country, achieving the overall goal of building a strong education system by 2035 [1]. Higher education is increasingly emphasizing the expansion from knowledge transmission and ability cultivation toward comprehensive human development. However, the phenomenon of "hollow disease" among university students has emerged as a prominent issue in higher education, attracting widespread attention from families, schools, and the government [2]. Hollow disease manifests as a sense of meaninglessness, emotional blunting, anxiety, and depression, and is characterized by its insensitivity to traditional psychological interventions.

Current explanations attribute hollow disease either to external factors such as intensified social competition, flaws in the education system, and high family expectations, or to individual psychological factors such as lack of belonging, self-identity crisis, or deficient self-efficacy [3-5]. Self-Determination Theory proposes that autonomy, competence, and relatedness are the basic psychological needs for forming healthy intrinsic motivation, and that frustration of these needs leads to extrinsic motivation or amotivation. The theory also distinguishes types of external motivation, such as identified regulation, integrated regulation, introjected regulation, and external regulation [6]. However, simply attributing hollow disease to "external regulation" or "introjected regulation" fails to explain why the hollow and anxious state persists even after external pressure disappears. Moreover, these models view hollow disease through a static lens,

making it difficult to describe its dynamic evolutionary process.

Based on these considerations, this paper proposes the "motivation compensation" model to reveal the dynamic formation process of hollow disease. This model defines "hollow disease" as a systematic psychological adaptive distortion, whose core mechanism involves the destruction of intrinsic motivation when sustained external pressure exceeds an individual' s psychological regulatory threshold. Faced with a survival crisis, the organism activates compensatory external motivation to replace the original intrinsic motivation system. The model not only reveals how external pressure triggers external motivation compensation but also explains the phenomenon of high-functioning hollow individuals and the self-sustaining nature of hollow symptoms, providing a more integrated theoretical framework for understanding and addressing "hollow disease."

2. Current Research Status of "Hollow Disease"

The concept of "hollow disease" was first proposed by Xu Kaiwen [2] to describe the psychological predicament experienced by some university students. Hollow disease is characterized primarily by the absence of meaning and self-identity, accompanied by anxiety, depression, and emotional blunting. Current interpretations of this phenomenon among university students mainly follow two approaches: psychological theories and external inducing factors.

Self-identity theory has been applied to explain hollow disease, positing that its core problem is meaninglessness, which relates to the existential vacuum in existentialism. When meaning is absent, individuals experience confusion and suffering [7]. This theory suggests that when individuals fail to achieve their goals during the self-identity exploration process, they fall into a self-identity crisis that may trigger hollow disease [8-11].

Self-efficacy theory has also been used to analyze hollow disease [12]. The concept of self-efficacy refers to an individual' s confidence in completing a specific task [13]. Individuals with higher self-efficacy are more proactive and optimistic when facing challenges and experience less anxiety or depression [3]. The lack of confidence and tendencies toward anxiety and depression manifested in hollow disease can be analyzed through self-efficacy theory as being related to learned helplessness caused by deficient self-efficacy [5].

Additionally, some research has focused on external environmental factors causing hollow disease. Family education is considered an important factor. When parents overemphasize academic life while neglecting emotional needs, show non-acceptance or disrespect, or adopt overly strict educational approaches, children lack inner security, fall into inferiority, and develop self-doubt [14]. Regarding school education, current schooling overemphasizes advancement rates, continuously pressuring students to achieve these goals. Moreover, overly singular evaluation systems cause some students to lose confidence, positioning themselves as incompetent or failures, generating inferiority complexes. Under sustained pressure, they sink into a quagmire of emptiness and anxiety, unable to obtain

psychological support and comfort from the outside world, feeling abandoned by the world and unable to find meaning in life [15].

Social environment is reportedly another important factor causing hollow disease among university students. As society develops and material living standards improve, a fast-paced and high-intensity lifestyle for study and work has become prevalent. High-intensity competition undermines self-confidence and generates pessimistic and negative emotions [16]. Additionally, economic transformation and uncertainty about future social development cause university students to feel confused about their studies and career planning. Simultaneously, society' s singular evaluation system forces many young people into it, preventing them from engaging in diversified attempts to develop their potential, all of which may lead to hollow disease [17]. Although these theories provide different perspectives for exploring the causes of hollow disease and have certain practical value, they lack investigation into the micro-level psychological mechanisms of hollow disease emergence.

Self-Determination Theory provides an important theoretical framework for understanding hollow disease. The theory emphasizes that humans inherently possess basic psychological needs for autonomy, competence, and relatedness [18]. When these needs are satisfied, healthy intrinsic motivation forms; when frustrated, extrinsic motivation or amotivation results. The theory also distinguishes the processes of internal and external motivation regulation, such as identified regulation, integrated regulation, introjected regulation, and external regulation. Under certain conditions, external motivation can be internalized through identified or integrated regulation into intrinsic motivation, becoming part of the self. However, when external pressure is excessive or psychological needs are continuously frustrated, external motivation maintains individual action through introjected or external regulation, causing enormous psychological internal friction and manifesting as a state of being highly effective yet suffering. Nevertheless, this theory struggles to explain why individuals continue to exhibit an addictive-like state of inner emptiness and anxiety even after external pressure decreases. Based on this, this paper attempts to propose the concept of "motivation compensation" to construct a more integrated explanatory model of motivational change.

3. "Motivation Compensation" Concept and Theoretical Foundation

3.1 Concept Definition and Core Connotation

"Motivation compensation" refers to the psychological process in which, under the continuous effect of external systemic pressure that exceeds an individual' s psychological regulatory threshold, the original motivation system centered on intrinsic interest, curiosity, meaning, and autonomy gradually becomes dysfunctional or fails. To cope with external pressure and maintain basic learning and living functions, individuals develop a compensatory motivation character-

ized by external orientation, anxiety-driven action, and priority on outcomes, replacing the original intrinsic motivation. The core connotations of this concept include: (1) **Threshold trigger mechanism**: The compensation reaction is not a linear development process but a qualitative response that occurs only when external pressure exceeds the regulatory threshold of the internal psychological system. (2) **External motivation compensation as functional replacement rather than benign supplement**: As an alienated motivational system, external motivation can maintain individual action but continuously causes psychological energy depletion and alienation from intrinsic meaning. (3) **Long-term external motivation-driven action further suppresses the repair of internal motivation**. (4) **Viewing motivation as a dynamic system**: Motivation compensation involves the reconstruction of the entire system rather than a single motivational shift. (5) **Motivation compensation encompasses the complete psychological process of threshold breakthrough, system imbalance, and functional reconfiguration**.

3.2 Theoretical Foundation of Motivation Compensation

The concept of "motivation compensation" is developed based on multiple classical theories.

3.2.1 Deepening of Self-Determination Theory. Deci and Ryan' s (2000) Self-Determination Theory distinguishes types of motivation and proposes a continuum of motivation internalization [18]. However, this theory adopts a static perspective and cannot clarify changes in the psychological system after internalization failure. The motivation compensation concept expands this theory by focusing on the reconstruction process of the psychological system when external pressure exceeds psychological regulatory capacity.

3.2.2 Introduction of Psychological Regulation Systems. Drawing on classical systems theory and dynamic theory, psychological regulation is conceptualized as an open system with self-organizing capacity and elastic limits [19-21]. Under moderate pressure, the psychological system can maintain stability of actions driven by internal and external motivation through adaptive regulation. However, when exceeding its elastic limit, a phase transition occurs, entering a new stable state—external motivation compensation state. Although this new state functionally replaces the original system, it is more fragile and energy-consuming [22-24].

3.2.3 Inspiration from Rehabilitation Engineering. In rehabilitation engineering, compensation is an important approach for functional restoration in individuals with functional disorders [25]. For example, when normal walking function is impaired, wheelchairs or prosthetics can replace human walking function. Although functional walking is achieved, wheelchair or prosthetic use causes certain psychological consumption for users compared to natural walking [26].

Figure 1

Figure 1: Figure 1

4. Construction and Operational Mechanism of the Motivation Compensation Theoretical Model

Based on the concept of motivation compensation, this paper constructs a theoretical model encompassing the compensation process and operational mechanism, describing the complete process from healthy integration to pathological compensation. This process is not simple linear development but a dynamic system containing multiple feedback loops and path dependencies.

As shown in Figure 1, when sustained external pressure acts on the psychological regulation system, two different adaptation paths can be distinguished based on the relationship between pressure level and the system' s regulatory threshold: (1) **Integrative adaptation path**: When external pressure is below the system' s regulatory threshold, the system can maintain balance through an integrative adaptation process [27]. Some external motivation is gradually internalized and works synergistically with intrinsic motivation to jointly promote learning activities. In this state, individuals are energetic, demonstrate high autonomy and sense of meaning, and internal and external motivations are in dynamic equilibrium. (2) **Pathological compensation path**: If external pressure continuously exceeds the system' s regulatory threshold, intrinsic motivation becomes suppressed and external motivation begins to dominate learning activities. Individuals exhibit a psychological regulation mode dominated by external control, manifesting as separation between behavior and experience, with significantly reduced autonomy and sense of meaning. Long-term residence in this state leads to disuse atrophy of the intrinsic motivation system, with cognitive-behavioral patterns gradually solidifying into an external reward-punishment-driven mode. Sustained behavior-experience separation easily triggers chronic psychological exhaustion, further damaging the intrinsic motivation system and lowering the system' s regulatory threshold, ultimately forming a self-sustaining vicious cycle. The specific developmental process can be divided into the following five stages.

Stage One: Healthy Integration Period—Digestion and Absorption of Extrinsic Motivation. In an ideal educational environment, external educational requirements and individual intrinsic interests form a positive interaction. Moderate curriculum requirements are accepted and internalized by students as self-challenges. The evaluation system provides important feedback that enhances individuals' sense of competence. Educational goals gradually merge with personal values, enabling students to distinguish between external requirements and individual interests, yet allowing both to coexist harmoniously. The key characteristic of this stage is the normal operation of the ability to integrate and digest external motivation. External motivation is transformed into support rather than a threat to intrinsic motivation. During the educational process, students' psychological energy is mainly used for exploration, understanding, and

creation, with low anxiety levels and a strong sense of meaning.

Stage Two: Pressure Accumulation Period—Overload of Self-Regulation System. When external pressure gradually increases, approaching but not yet exceeding the individual' s psychological threshold, the system enters the pressure accumulation period. The integration of external motivation begins to feel difficult, requiring substantial psychological energy to maintain balance. During this process, students clearly perceive conflicts between internal and external motivations, viewing external motivation as a threat rather than a support. Individual anxiety levels rise but remain within controllable limits. The core characteristic of this stage is rising student anxiety, increased psychological energy consumption, partial separation between internal and external motivations, and maintenance of learning through dynamic balance between the two. If academic pressure is reduced or adequate external support is provided at this stage, the system can restore balance. However, if pressure continues to increase and gradually approaches the compensation threshold, the system moves toward the next stage.

Stage Three: Threshold Breakthrough Period—Failure of Self-Regulation Mechanism. When external pressure exceeds the individual' s compensation threshold, a qualitative change occurs in the motivation system: the motivation integration mechanism completely fails. External pressure is treated as a foreign body, fully activating psychological defense mechanisms. Common defenses include emotional isolation (separating learning from emotion), intellectualization (overemphasizing the instrumental value of learning while neglecting its intrinsic value), projection (attributing externally motivated behavior that one is unwilling to acknowledge to the environment), etc. During this process, learning activities become separated from the self, anxiety gradually increases, and sense of meaning drops sharply. Learning motivation is primarily driven by anxiety. The breakthrough of individual thresholds may result from sustained pressure or from major stressful events (such as failure in important examinations). Different individuals show different threshold breakthrough manifestations: some may suddenly "collapse" with obvious motivational exhaustion, while others may superficially maintain functionality despite fundamental changes in their intrinsic motivation system.

Stage Four: Compensation System Formation Period—Establishment of Functional Replacement Structure. After threshold breakthrough, individuals experience a sharp decline in psychological energy, and intrinsic motivation can no longer maintain learning activities. Faced with sustained external pressure, individuals no longer attempt to maintain the original intrinsic motivation system but construct a compensation system specifically designed to cope with external pressure. Learning goals shift from individually identified, diversified, developmental objectives to externally determined, singular, outcome-based goal systems. Learning regulation transforms from interest-driven autonomous regulation to anxiety-driven controlled regulation. Cognitive strategies shift from conceptual understanding and deep learning to test-taking skill

acquisition. Anxiety replaces original interest as the primary behavioral driving factor. The formation of the compensation system is a functional adaptive regulation process. It can maintain learning behavior to a certain extent and may even improve certain performance indicators (such as test scores) in the short term, but this success is fragile, energy-intensive, and unsustainable.

Stage Five: Hollow Disease Consolidation Period—Self-Reinforcement of the Compensation System. When the compensatory motivation system long dominates an individual' s learning life, a stable pathological state forms. Individuals lack self-identity, learning loses intrinsic meaning, emotions become hollow, and activities become instrumental. Learning processes lack emotional investment, replaced by numbness or anxiety. Interpersonal relationships become instrumental, viewing teachers and classmates as resource providers or competitors rather than forming deep emotional connections. More seriously, this process forms a self-reinforcing vicious cycle. Hollow disease symptoms prevent individuals from obtaining satisfaction from learning, making them more dependent on the compensation system. The continuous operation of the compensation system further consumes psychological energy, and the long-term high-pressure and high-energy-consumption state completely suppresses intrinsic motivation. This cycle makes the hollow disease state maintained by external motivation increasingly stable and persistent, with increasing difficulty for reversal.

It is important to emphasize that not all students experience these five stages, nor do they necessarily develop linearly. The model has the following characteristics: (1) **Multi-path development possibilities**: Different students may enter the compensation process through different paths. Some students may linger in the first two stages for extended periods, some may rapidly pass through all stages, and some may jump directly from stage one to stage three due to major single traumatic events. (2) **Reversibility at different stages**: Through appropriate interventions, the process may be reversed or interrupted in the first three stages. However, in the later part of stage four and stage five, the compensation system has formed a stable structure, requiring more systematic and long-term efforts for reversal. When the compensation system is completely solidified and deeply integrated with self-identity, reversal becomes extremely difficult. (3) **Dynamic threshold changes**: An individual' s compensation threshold is not fixed. In healthy states, good self-care and social support can raise the threshold; in compensation states, long-term pressure and psychological resource consumption lower the threshold, forming a vicious cycle.

5. Theoretical Boundaries and Limitations of the Model

This study is based on a cross-disciplinary consensus: individual psychological systems have limited self-regulation capacity, and when environmental pressure continuously exceeds critical thresholds, it leads to maladaptive or functional collapse of the system [28,29]. This study proposes that in high-pressure meritocratic environments, the collapse of learning motivation does not manifest

as simple motivational weakening but triggers a systematic pathological process called "compensation" : the system switches functions, with the extrinsic motivation subsystem dominating and replacing the damaged intrinsic motivation subsystem, thereby forming a pathological steady state of "hollow disease" phenomenon. This provides a novel, mechanism-based supplement to understanding the manifestation of the classic Self-Determination Theory framework in specific contexts. The model systematically introduces the threshold concept into learning motivation research for the first time, explaining why the same pressure produces different effects on different individuals and the qualitative change phenomena in motivational transformation. This supplement perfects the micro-mechanisms of Self-Determination Theory. The model views motivational change as a phase transition process of the system rather than linear quantitative change, a perspective that better aligns with actual observations of motivational changes, particularly the "sudden collapse" or "gradual numbness" phenomena observed in hollow disease. The model constructs a complete continuous spectrum from healthy integration to pathological compensation, filling the theoretical gap in describing the process after integration failure and clarifying the transformation mechanism from "integrable pressure" to "compensatory pressure."

The "motivation compensation" model constructed in this study primarily explains a pathological process of individual motivational change under high-intensity external pressure (such as meritocracy). Clarifying its theoretical boundaries helps distinguish it from other paths leading to similar negative outcomes. Another equally important and potentially coexisting path is "dual-system failure of the motivation system," where intrinsic motivation function declines while the external environment fails to provide adequate support, feedback, and meaning that individuals can utilize, causing the entire system to enter a "dysfunctional state" manifesting typical loss of interest and depression. This differs significantly from the "compensation path" described in this model. First, compensation occurs when, under external pressure, the intrinsic motivation regulation system's self-regulation function fails and functional replacement occurs, with individuals in a high-consumption, high-functioning "prosthetic running" state. Dual-system failure represents a "complete shutdown" of the motivation system, with individuals in a low-functioning, directionless "dysfunctional stagnation state." Second, the compensation path typically manifests anxiety and emotional exhaustion, while the dual-system exhaustion path more commonly shows depression-related symptoms. Finally, "compensation" mostly occurs in high-competition, high-control, and high-feedback conditions, whereas dual-system failure may stem from high-competition, high-control, low-feedback environments or from simultaneous collapse of internal and external support systems after encountering uncontrollable setbacks.

Clarifying this distinction allows more precise delineation of the model' s applicability: this model is particularly suitable for explaining why today' s generally "overheated" educational and social competition ecology systematically produces large numbers of "high-functioning, high-suffering" "hollow individuals" —this

contradictory phenomenon. These two paths may even constitute a continuous developmental spectrum: after long-term "compensation" 透支, once external support or rewards cease or major failure is encountered, the compensation system collapses, and individuals may slide into a more thorough "dual-system failure" state.

It must be acknowledged that the model proposed in this study has certain limitations: (1) The model is primarily based on theoretical deduction, phenomenological observation, and integration of existing research, and has not yet undergone systematic validation through large-scale empirical studies. The specific conversion mechanisms at each stage, measurement methods for thresholds, and specific weights of influencing factors require further verification. The model was primarily constructed based on the Chinese higher education context. Although it attempts to propose universal mechanisms, its applicability across different cultural backgrounds requires further investigation. Particularly, how collectivist versus individualist cultures influence compensation thresholds and manifestations deserves in-depth research. (2) The model' s key concepts such as "psychological regulation threshold," "compensation phenomenon," and "compensation degree" lack standardized measurement tools, limiting the model' s empirical testing and application promotion. (3) The model primarily focuses on psychological and social levels and does not address the neurobiological basis of the motivation system. Are there corresponding neural mechanisms for threshold breakthrough? Does compensation system formation accompany neuroplastic changes? These questions merit future research.

6. Summary and Outlook

The widespread phenomenon of hollow disease among contemporary university students reflects a deep crisis in the education system. The "learning motivation compensation" model proposed in this paper attempts to reveal the psychological mechanism behind this phenomenon: it is not simply motivational weakening or lack of interest but functional alienation and reconstruction of the entire motivation system. The model' s core contribution lies in proposing the compensation threshold concept, explaining why the same educational pressure allows some students to maintain intrinsic motivation vitality while others fall into motivational alienation. This model tells us that hollow disease is by no means individual psychological fragility but rather a psychological adaptation result of systemic pressure exceeding individual regulatory thresholds. It affects not only "failures" but also "successors" and "adapters." It is not merely a psychological problem but also an educational, cultural, and social problem.

The model reveals that solving university students' hollow disease relies solely on higher education is far from sufficient. It requires joint efforts from families, society, and school education throughout the entire process. In educational practice, we must recognize that completely eliminating pressure is neither realistic nor necessary; moderate pressure is essential for growth, but excessive pressure exceeding psychological regulatory thresholds leads to motivational system

alienation and hollow disease. The key to solving this dilemma is not simply reducing pressure but effectively managing it, ensuring pressure remains within most students' compensation thresholds, providing appropriate redundancy for the psychological system to maintain its long-term efficient operation. Simultaneously, we must help students raise their thresholds to better cope with pressure.

Educational reform based on the compensation model should be systematic. At the individual level, help students develop integration abilities and raise psychological system thresholds. At the curriculum level, design threshold-friendly learning tasks and evaluation methods. At the institutional level, establish pressure monitoring and flexible support systems. At the cultural level, redefine success and failure and reduce the dominance of instrumental rationality.

The learning motivation compensation model provides us with theoretical tools to understand and change this status quo. By identifying the compensation process and designing decompensation strategies, we have hope to break the vicious cycle of hollow disease and help university students rediscover the joy of learning, passion for life, and meaning of existence. This is not only for individual mental health and comprehensive development but also for the sustainable future of higher education and society as a whole.

Although this study focuses on the university student population, as a descriptive concept, "motivation compensation" and its core mechanism—the process of individuals systematically turning to external goal-driven behavior when intrinsic meaning is absent—may have broader explanatory power. For example, future research could explore its manifestations and variants in workplace environments (such as occupational burnout and excessive competition) and intimate relationships (such as formalized interactions). This provides a unified theoretical perspective for understanding the widespread "behavior-meaning" separation phenomenon in modern society.

In summary, motivation compensation is not only a model explaining the psychological predicament of specific groups; it may more profoundly reveal a universal psychological process under modern conditions: when intrinsic values become blurred or absent in rapidly changing societies, individuals must turn to external, quantifiable goal systems to drive behavior to maintain social functioning and self-identity. While this process brings short-term efficiency, it may also lead to alienation between individuals and their authentic experiences and meanings—a form of "psychological alienation."

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Author Contribution Statement:
This research, from the initial conceptualization, theoretical framework design, core concept derivation, and model construction to the complete writing and final revision of the paper, was independently completed by Wang Ranran. All viewpoints, models, and conclusions presented in this paper represent original work.