Psychological Energy Investment Theory: An Integrative Model Revealing the Formation Mechanism of Hollow-Heart Disease

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Abstract

[Objective] To address the lack of a mechanism-level explanation for the phenomenon of "empty heart disease" among university students, characterized by good external functioning but an inner emptiness and deficiency in sense of value, this study proposes the "psychological energy investment theory" to reveal its formation mechanism. [Methods] This study adopts theoretical integration and model construction to build a theoretical framework around the components of psychological energy. It proposes that the only ultimate source of psychological energy is the energetic support provided by the metabolism of the biological organism. On this basis, sense of self-worth is defined as "fixed assets" at the psychological level, attention as "current assets," and self-efficacy as a "psychological credit score." The model distinguishes two modes of attention mobilization: mobilization driven by autonomous motivation is regarded as "cash payment," whereas mobilization driven by controlled motivation is regarded as "loan payment," which uses sense of self-worth as collateral and requires additional payment of "interest" (psychological internal friction). Meanwhile, the model clarifies the profit-and-loss logic of psychological tasks: under autonomous motivation, task success simultaneously enhances self-efficacy and sense of self-worth, while the damage of failure to sense of self-worth depends on attributional patterns; under controlled motivation, task success enhances both only when self-identification is obtained, otherwise it enhances only self-efficacy, whereas task failure necessarily causes a double loss, with attribution determining whether sense of self-worth is further damaged. [Results] The model reveals that the essence of empty heart disease among university students is a "bankruptcy state of fixed assets in the psychological account" : individuals have long adopted behavior patterns driven by controlled motivation in their learning activities, continuously mortgaging their sense of self-worth, yet have never transformed successful experiences into actual accumulation of sense of self-worth. Low sense of self-worth weakens autonomous motivation and inhibits exploratory desire, trapping individuals in a vicious cycle dominated by controlled motivation. The model further explains the core paradox of "high functioning, low value" in empty heart disease: individuals' self-efficacy can be maintained or even continuously enhanced, while their sense of self-worth is constantly eroded through repeated use of controlled motivation-driven processes. [Conclusion] The psychological energy investment model indicates that the root cause of "empty heart disease"is a psychological "asset-liability"crisis rather than merely a problem of ability or emotion. Its therapeutic direction is clear: the true path to recovery is not the pursuit of more external success, but stopping "borrowing," acknowledging the bankruptcy state of the psychological account, and restarting "autonomous motivation investment" in the smallest possible units, thereby gradually repairing sense of self-worth as the "fixed asset." This study provides a new theoretical perspective and an operable practical pathway for mental health interventions among university students.

Full Text

Psychological Energy Investment Theory: An Integrative Model Revealing the Formation Mechanism of Hollow-Heart Disease

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Abstract:

[**Objective**] In response to the problem that the phenomenon of "hollow-heart disease" among university students—namely, good external functioning accompanied by an inner emptiness and lack of a sense of value—lacks a mechanistic explanation, this study proposes the "psychological energy investment theory" to reveal the formation mechanism of hollow-heart disease.

[**Methods**] This study adopts theoretical integration and model construction, building a theoretical framework around the components of psychological energy. It proposes that the sole ultimate source of psychological energy is the energy support provided by the metabolism of the biological organism. On this basis, sense of self-worth is defined as a psychological "fixed asset," attention as a "current asset," and self-efficacy as a "psychological credit score." The model distinguishes between two modes of attention allocation: allocation driven by autonomous motivation is regarded as "cash payment"; allocation driven by controlled motivation is regarded as "loan payment," which uses sense of self-worth as collateral and requires the additional payment of "interest" (psychological internal friction). At the same time, the model clarifies the profit-and-loss logic of psychological tasks: under autonomous motivation, task success simultaneously enhances self-efficacy and sense of self-worth, while the damage caused by failure to sense of worth depends on the attributional pattern; under controlled motivation, task success can enhance both only when self-recognition is obtained —otherwise it enhances only self-efficacy—whereas task failure inevitably causes a double loss, and attribution determines whether sense of worth is further damaged.

[**Results**] The model reveals that the essence of hollow-heart disease among university students is a state of "bankruptcy of fixed assets in the psychological account": individuals have long adopted controlled-motivation-driven behavioral patterns in learning activities, continuously mortgaging their sense of self-worth, yet have never been able to transform successful experiences into actual accumulation of self-worth. Low sense of self-worth weakens autonomous motivation and suppresses the desire to explore, causing the individual to fall into a vicious cycle dominated by controlled motivation. The model further explains the core paradox of hollow-heart disease— "high functioning, low value": the individual' s

self-efficacy is maintained or even continuously improved, while the sense of self-worth is steadily eroded through repeated use of controlled-motivation-driven processes.

[**Conclusion**] The psychological energy investment model indicates that the root cause of "hollow-heart disease"is a psychological "asset-liability"crisis, rather than a simple problem of ability or emotion. Its therapeutic direction is clear: the true path to recovery is not the pursuit of more external success, but rather stopping "borrowing," acknowledging the bankrupt state of the psychological account, and reinvesting in the smallest units of "autonomous motivation," so as to gradually repair sense of self-worth as the "fixed asset." This study provides a new theoretical perspective and an operationalizable practical pathway for interventions in university students' mental health.

Keywords: psychological energy investment; hollow-heart disease; formation mechanism; integrative model

Psychological Energy Investment Theory: An Integrative Model

Revealing the Formation Mechanism of "Hollow Disease"

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Abstract:

[**Objective**] This study addresses the phenomenon of "hollow disease" among university students, characterized by intact external functioning but an inner void of value, and proposes the "Psychological Energy Investment Theory" to reveal its underlying formation mechanism.

[**Methods**] This study adopted theoretical integration and model construction approaches to build a theoretical framework around the composition of psychological energy. It posits that the sole ultimate source of psychological energy is the energetic support provided by the organism' s metabolism. On this basis, self-worth is conceptualized as psychological "fixed asset," attention as "current asset," and self-efficacy as "psychological credit score." The model distinguishes two modes of attention allocation: allocation driven by autonomous motivation is regarded as "cash payment," while allocation driven by controlled motivation is regarded as "loan payment," which uses self-worth as collateral and incurs additional "interest" (psychological internal friction). Meanwhile, the model specifies the gain-loss logic of psychological tasks: under autonomous motivation, task success simultaneously enhances both self-efficacy and self-worth, while

the damage to self-worth from failure depends on attribution patterns; under controlled motivation, task success enhances both only when self-approval is attained; otherwise, it enhances only self-efficacy, whereas task failure inevitably results in dual losses, with attribution further moderating the degree of damage to self-worth.

[**Results**] The model reveals that the essence of hollow disease in university students is a state of "fixed asset bankruptcy in the psychological account"—that is, individuals persistently adopt behaviors driven by controlled motivation to pursue academic achievements, continuously mortgaging their self-worth, yet failing to convert successful experiences into tangible accumulation of self-worth. Low self-worth undermines autonomous motivation and inhibits exploratory drive, trapping individuals in a vicious cycle dominated by controlled motivation. The model further explains the core paradox of hollow disease— "high functioning, low value" : individuals' self-efficacy is maintained or even enhanced, while their self-worth is gradually eroded through the repeated use of controlled motivation.

[**Conclusion**] The Psychological Energy Investment Model indicates that the root cause of hollow disease is a psychological "asset-liability" crisis rather than a mere deficit in ability or emotional regulation. Its therapeutic direction is clear: genuine recovery does not lie in pursuing more external success, but in ceasing "loans," acknowledging the state of psychological bankruptcy, and re-initiating minimal units of "autonomous motivation investment" to gradually restore self-worth as a "fixed asset." This study provides a novel theoretical perspective and actionable practical pathways for mental health interventions among university students.

Keywords: psychological energy investment; hollow disease; formation mechanism; integrative model

1. Introduction

In recent years, mental health problems among university students have become increasingly salient. One psychological predicament, characterized chiefly by "emotional numbness and a hollow sense of self-worth," has attracted broad attention from both academia and the education sector. This phenomenon has been vividly referred to as "empty-heart disease" [1]. Unlike traditional psychological disorders, such as anxiety and depression, individuals with "empty-heart disease" often remain able to maintain a certain level of social functioning and may even attain external achievements, yet their inner experience remains persistently depleted. This condition not only seriously impairs university students' quality of life and developmental potential, but also poses a challenge to existing theoretical systems of mental health.

At present, explanations of "empty-heart disease" fall mainly into two categories. The first emphasizes pressures from the external environment, such as academic competition, employment anxiety, and excessively high family expectations, arguing that individuals fall into exhaustion under sustained stress loads [2,3].

The second starts from the perspective of individual pathology, attributing the condition to low self-esteem, attachment trauma, or problems of self-identity [4–8]. However, these explanations generally have obvious limitations. First, most are static and descriptive frameworks, making it difficult to reveal the internal dynamic mechanisms through which "empty-heart disease" emerges and is maintained. Second, they lack clear therapeutic directionality, often offering generalized suggestions such as "searching for meaning" or "strengthening the self," yet failing to answer a key question: why is a person who already feels "empty" unable either to obtain satisfaction from external success or to be effectively repaired through traditional psychological interventions?

This paper attempts to construct an integrative explanatory framework—the "psychological energy investment model"—in order to provide a deeper account of the internal psychological mechanisms underlying the emergence of "empty-heart disease." Drawing on self-worth theory, self-efficacy theory, self-determination theory, flow theory, and the economic concept of return on investment, this model redefines an individual' s psychological activity as a form of "investment behavior" involving psychological energy. Psychological energy is defined as the finite resource consumed when an individual mobilizes cognitive, emotional, and behavioral control systems; its fundamental source is the energy support supplied by the metabolism of the biological organism [9]. Psychological energy includes fixed assets, namely the sense of self-worth; liquid assets, namely attention; and a psychological credit score, namely the sense of self-efficacy. On this basis, the model distinguishes between two fundamentally different modes of psychological investment: first, investment using "principal," that is, a behavioral mode driven by autonomous motivation; and second, investment using "loans," that is, investment driven by controlled motivation.

motivated behavioral pattern. In addition, this study defines the gain–loss logic of psychological tasks: under the drive of autonomous motivation, task success simultaneously enhances both self-efficacy and self-worth; if the task fails, the extent of damage to self-worth depends on the individual' s attributional pattern for failure [10]. By contrast, under the drive of controlled motivation, task success can enhance both self-efficacy and self-worth only when the outcome gains the individual' s self-recognition; otherwise, it can only bring an increase in self-efficacy. However, once the task fails, it will inevitably trigger a dual loss of self-efficacy and self-worth (i.e., "forfeiture of collateral"), and failure attribution determines whether self-worth will suffer further loss [11-13].

2 Contributions and Limitations of Existing Research

As a psychological predicament increasingly prominent among college students, "empty-heart disease" is characterized primarily by nihilistic values, emotional numbness, and a loss of the sense of self. Although existing research has not yet formed a unified explanatory framework, valuable findings have accumulated in related fields. This chapter reviews three major categories of research, clarifies their contributions, and points out their limitations in explaining the dynamic

generative mechanism of "empty-heart disease."

2.1 External Pressure Perspective

Research has attributed "empty-heart disease" to persistent and overloaded external environmental pressure. Scholars have pointed out that college students face multiple stressors, such as academic competition, employment anxiety, peer comparison, and high family expectations [2,3]. In addition, some scholars have argued that the intrusion of the social field, a utilitarian social climate, and relational alienation are the main causes of empty-heart disease [14]. These studies reveal the external triggering conditions for the occurrence of "empty-heart disease" and provide a socio-ecological basis for explaining "why contemporary college students are more prone to emptiness." However, this perspective is essentially an "input–output" linear model: external pressure is input, and value emptiness is output. It cannot explain two key phenomena: first, why many college students in similar environments do not fall into "empty-heart disease"; and second, why some "empty" individuals are still able to complete external tasks and even achieve academic or social "success."

2.2 Individual Pathology Perspective

Another line of research starts from the individual's internal psychological structure and diagnoses "empty-heart disease" as an external manifestation of a crisis in self-identity development. Its main causes are insufficient commitment and obstructed self-exploration [6,15]. In addition, some scholars regard empty-heart disease as a derivative symptom of low self-esteem and insecure attachment [5,8]. This approach holds that the essence of "emptiness" lies in the individual's failure to establish a stable, internally driven self-identity, with the person's sense of self-worth being highly dependent on external feedback. This perspective accurately captures the typical characteristics of patients with "empty-heart disease": a lack of internal direction, sensitivity to external evaluation, and a vague sense of self. It provides an important dimension for clinical assessment. The main problem with this perspective is that it is more descriptive than explanatory. It tells us "what the empty-hearted person lacks" (such as a stable self-identity and intrinsic motivation), but fails to explain "how this lack arises and how it dynamically sustains individual behavior." More importantly, existing pathological models often imply an assumption: as long as self-identity is repaired or self-esteem is enhanced, "empty-heart disease" will be alleviated. In practice, however, this assumption has encountered difficulties. Many intervention attempts have had limited effects. This suggests that the individual-pathology perspective may confuse "cause" and "effect": the absence of a sense of self-worth may itself be the product of a deeper dynamic mechanism rather than the root cause [6].

2.3 Motivation Perspective

The "motivational compensation"theoretical model that I proposed earlier points out that when external pressure exceeds the regulatory threshold of the psychological system, the individual, facing an existential crisis, will have external motivation replace intrinsic motivation. The individual' s behavior gradually shifts from being interest-driven to being anxiety-driven, ultimately forming a pathological steady state dominated by external motivation and thereby causing sustained psychological depletion. This pathway understands "empty-heart disease" as a systematic distortion of psychological adaptation [16]. The motivational-compensation perspective was the first to describe the dynamic formation process of "empty-heart disease." It explains the core contradiction whereby individuals remain functional in their overt behavior (driven by anxiety), while their inner experience is continuously depleted (loss of interest and sense of meaning). However, this model still has two unresolved problems. First, it describes the "triggering condition" under which intrinsic motivation is replaced by external motivation—namely, the breaching of the psychological system' s threshold—but it does not clarify what the specific marker of this breach is; that is, exactly what state must be reached before it can be judged that "the threshold has been breached." Second, the occurrence of the motivational-compensation process psycho-

theoretical mechanism has not yet been clearly elucidated: through what pathway, exactly, does external motivation replace internal motivation? These two questions point to the same deeper need: a foundational model capable of describing the internal dynamic processes of the psychological system.

In summary, the external-pressure perspective reveals the environmental triggering conditions of hollow-heart syndrome; the individual-pathology perspective describes the psychological structural characteristics of those with hollow-heart syndrome; and the motivation-substitution perspective depicts dynamic changes at the motivational level. However, the three perspectives share a common limitation: they lack an underlying theoretical framework capable of integrating the sources of psychological energy, its mobilization mechanism, and the logic by which it is transformed into a sense of value, so as to explain the core feature of hollow-heart syndrome— "high functioning, low value." In response to this theoretical gap, the present study constructs a "theory of psychological energy investment." This theory attempts to establish connections among the sources and allocation of psychological energy, the transformation of self-worth, and the transformation of self-efficacy, in order to reveal the dynamic generative mechanism of hollow-heart syndrome and the logic by which it is maintained.

3 The Proposal and Theoretical Foundations of Psychological Energy Investment

3.1 Conceptual Definition and Core Connotations

This article continues the concept of the psychological system proposed in motivation-compensation theory. It regards the "psychological system" as a dynamic system that sustains individual behavior, and the health of its operation is determined by psychological energy. On this basis, the "theory of psychological energy investment" is proposed, understanding individual behavioral activity as a process of investing psychological energy. The core of the theory lies in conceptualizing psychological functioning as a dynamic process of "energy input—mobilization and allocation—value transformation." This study defines the sense of self-worth as "fixed assets," which constitute the ballast of psychological energy; attention is defined as the "current assets" within the structure of psychological energy and is the direct resource by which individuals conduct psychological investment. Self-efficacy is defined as a "psychological credit score," determining an individual' s willingness and cost to mobilize attention. This article first provides clear definitions of several core concepts involved in the theory. Psychological energy: The psychological energy referred to in this theory is neither the "libido" in Jungian analytical psychology as the driving force of personality [17], nor the "mental effort" in cognitive psychology that focuses only on allocation and consumption [18]. Rather, it is defined as the limited resource on which an individual relies when carrying out all cognitive, emotional, or behavioral-control tasks. It is not itself a specific mental activity, but instead what all mental activities 所

the basic energy required, which includes attention, self-worth, and self-efficacy. The sole ultimate source of psychological energy is the energy supplied by the metabolism of the individual biological organism: nutritional intake and sleep. Nutritional intake provides neurons with immediate fuel for executing functions, namely glucose and oxygen; sleep is responsible for clearing metabolic waste, restoring neurotransmitter sensitivity, and resetting energy capacity. Together, the two constitute the material foundation of psychological energy. The energy consumption invoked by all higher-level psychological activities—such as attention or willpower, judgment and decision-making—can ultimately be traced back to this foundational level. In addition, individuals differ innately in their reserves of psychological energy. These differences are determined in part by genetic factors and are also influenced by later developmental environments, histories of illness, habits of physical exercise, and other factors. This means that even under identical conditions of nutritional intake and sleep, different individuals may differ significantly in psychological energy capacity, rate of consumption, and ability to recover. Such variability constitutes an important premise for understanding individual differences in psychological energy and for formulating personalized intervention strategies.

Attention is the most direct form in which psychological energy is invested at the

cognitive level, manifesting as the active allocation of limited resources. Kahneman (1973) clearly pointed out in his single-resource model that the execution of any psychological operation, in essence, depends on the directed focusing of attention so as to mobilize the corresponding cognitive resources, thereby transforming psychological energy into effective task output [18]. However, this allocation mechanism is highly passively vulnerable: attention is extremely easily and automatically hijacked by trauma-related threatening cues [19] or by dopamine-driven rewarding stimuli [20].

Self-efficacy is an individual' s belief in their ability to complete a specific task, deriving primarily from the accumulation of past successful experiences. In the theory of psychological energy investment, self-efficacy is defined as a "psychological credit score" : it determines an individual' s willingness to mobilize attention, as well as the additional psychological cost that must be paid in the process of mobilization—that is, the level of "interest."

Self-worth is an individual' s affirmation and acceptance of their overall value. It is relationship-specific and is the most stable and most central component of psychological capital. In this theory, self-worth is defined as a "fixed asset." It is the ballast stone for resisting psychological risk and maintaining mental health. The core source of self-worth is mainly the indi-

For individuals driven by "autonomous motivation," the successful experiences that occur in the process of attaining goals—that is, the accumulated experience of achieving expected outcomes through one' s own actions—constitute such assets. Each successful experience is equivalent to adding another brick to these "fixed assets." This process begins in infancy, when a child attracts the caregiver' s attention and thereby obtains satisfaction, and continues throughout the entire life cycle. It is worth noting that when behavior driven by "controlled motivation" succeeds, the transformation into a sense of self-worth must pass through the internal gate of "self-approval." Successful experience itself does not automatically generate a sense of self-worth; the individual must subjectively recognize that the success is meaningful, conforms to his or her own values, or at least does not violate self-identity. In this process, recognition from significant others merely plays the role of an "external signal" or "catalyst" : it provides the individual with feedback that is easy to interpret and helps the individual—especially one whose capacity for self-approval is not yet mature—arrive at self-approval more smoothly. However, it is neither a necessary condition nor can it bypass self-approval to directly produce a sense of self-worth. Therefore, the genuine accumulation of psychological fixed assets ultimately depends on the individual' s development of an independent capacity for self-approval.

The profit-and-loss logic of psychological energy investment is as follows: under autonomous motivation, task success simultaneously enhances self-efficacy and self-worth; if the task fails, the extent of damage to self-worth depends on the individual' s pattern of failure attribution. By contrast, under controlled motivation, task success can simultaneously enhance self-efficacy and self-worth only when the outcome receives the individual' s self-approval; otherwise, it can

only bring about an increase in self-efficacy. However, once the task fails, it inevitably triggers a dual loss of self-efficacy and self-worth (i.e., "confiscation of collateral"), and failure attribution determines whether self-worth suffers further loss. Together, the above concepts constitute the core connotation of psychological energy investment theory. On this basis, this paper will further elaborate the sources, mobilization, allocation, and transformation mechanisms of psychological energy, as well as how this process leads to the formation of hollow heart disease among university students.

3.2 Foundations of Psychological Energy Investment Theory

Psychological energy investment theory is not constructed out of thin air; rather, it is formed on the basis of integrating multiple mature theoretical traditions. These theories, from different perspectives such as attention allocation, value maintenance, competence beliefs, motivational satisfaction, and optimal experience, provide important insights for understanding the sources, mobilization, and transformation of psychological energy.

3.2.1 The Concept of Psychological Energy: Psychology' s exploration of psychological energy has evolved from instinctual drives to cognitive resources. Jung went beyond Freud' s limitation of the sexual instinct and defined "libido" as a universal, nonspecific life energy—that is, "psychological energy" —regarding it as the fundamental motive force that drives all psychological activities, such as thinking, emotion, and intuition, whether these activities occur at the conscious or unconscious level [17]. On this basis, Kahneman further revealed the operating mechanism of psychological energy, pointing out that the essence of attention is the process of allocating psychological energy: the total amount of psychological energy is limited and has a unified source, and its functions are realized through the allocation of attention among different tasks. Kahneman' s model mainly explains conscious, goal-directed allocation of attention, i.e., active investment [18]. However, subsequent research and clinical observations have found that the allocation of attention is not only controlled by individual will, but is also extensively and passively captured by dopamine-driven rewarding stimuli and by psychological contents at the unconscious level, such as unprocessed emotions, traumatic memories, and automatic negative thoughts. This passive, uncontrolled allocation of attention constitutes the "passive leakage" of psychological energy [19-21]. Although individuals have not actively invested attention, psychological energy is continuously consumed by internal psychological activities—namely rumination and internal depletion—which is precisely one of the core mechanisms underlying the psychological difficulties of modern people.

Based on the theoretical origins described above, this theory defines psychological energy as the energy resource required for individuals to carry out all psychological activities. Its structure can be divided into three levels: attention is a liquid asset, self-efficacy is a credit rating, and sense of self-worth is a

fixed asset. The only ultimate source of psychological energy is the individual' s most basic metabolic activity. By actively investing attention in small, achievable goals, individuals accumulate self-efficacy; by investing attention over the long term and in a stable manner in relationships and endeavors that receive self-approval, individuals build a sense of self-worth. Therefore, psychological energy is obtained through a physiological foundation, and it can also realize the appreciation of self-efficacy and sense of self-worth through effective "attention investment."

3.2.2 Sense of Self-Worth: Self-worth theory was proposed by Covington (1984), revealing the core concept of "whether I have value" [22]. Its core viewpoint is: in competitive environments, individuals are most

The fundamental motivation is to maintain a sense of self-worth. People generally believe that "being capable means being valuable" ; therefore, the fear of failure is essentially not a fear of failure itself, but a fear of the "incompetence" that failure proves, which poses a serious threat to one' s sense of self-worth. An important finding of self-worth theory is the "inverse relationship between ability and effort" : high ability is believed not to require much effort, whereas effort may instead imply insufficient ability; thus, individuals may choose not to exert effort in order to preserve their sense of self-worth. This theory provides important theoretical support for the model's conception of self-worth as a "fixed asset." Psychological energy investment theory further points out that self-worth is not only an object to be maintained, but also a core asset in psychological investment. When individuals long rely on "controlled motivation" to complete tasks, each activation mortgages part of their sense of self-worth. If, after task success, they lack self-recognition or relational recognition, the collateral cannot be redeemed, and their sense of self-worth will continue to diminish.

3.2.3 Self-efficacy

Self-efficacy theory was proposed by Bandura (1977). Its core concept is self-efficacy: an individual' s belief in their own ability to complete a specific task [23]. Self-efficacy mainly derives from four sources: mastery experiences, vicarious experiences, verbal persuasion, and physiological and emotional states. Individuals with high self-efficacy tend to choose more challenging goals, exert more effort, and persist more in the face of difficulties. In psychological energy investment theory, self-efficacy is defined as a "psychological credit score." This means that high self-efficacy indicates that the individual has a richer reserve of successful experiences, which makes them more confident when facing challenges, reduces the difficulty of mobilizing attention (requiring less willpower), and lowers the cost of mobilization—that is, "good credit, low interest."

3.2.4 Self-Determination Theory

Self-Determination Theory (SDT), proposed by Deci and Ryan (1985), is a core theoretical framework for understanding human intrinsic motivation. The

theory holds that the motivation underlying human behavior can be divided, according to its degree of autonomy, into autonomous motivation and controlled motivation [24]. Its core contribution lies in revealing that motivations of different qualities give rise to markedly different modes of cognitive processing and psychological experience: when individuals act from autonomous motivation, their behavior is deeply integrated with the need for self-realization, and what they experience is free choice and psychological integration; conversely,

In contrast, when behavior is driven by controlled motivation, even if individuals expend an equal or even greater amount of volitional effort, they are often accompanied by inner conflict and a sense of self-alienation. This distinction constitutes a key theoretical fulcrum for this paper's understanding of the input–return structure of psychological energy across different behavioral modes. On this basis, the present study further distinguishes between two fundamentally different modes of psychological investment: when individuals adopt a behavioral mode driven by autonomous motivation, the mobilization of psychological energy is accompanied by a high degree of self-consistency and intrinsic satisfaction, does not involve mortgaging one' s sense of self-worth, and represents a low-cost, high-efficiency mode of investment—namely, "using principal" ; by contrast, when individuals adopt a behavioral mode driven by controlled motivation, its essence is to mortgage the sense of self-worth and forcibly sustain the investment of attention through willpower. This process inevitably gives rise to psychological internal friction and thus becomes a high-cost, low-efficiency mode of investment—namely, "using loans."

3.2.5 Flow Theory

Flow theory was proposed by Csikszentmihalyi (1975) and describes an optimal experiential state of complete immersion in the activity at hand. In a state of flow, individuals experience a high degree of concentration, clear feedback, a balance between challenge and skill, the merging of action and awareness, and a distortion of the sense of time. The core feature of flow lies in the fact that the allocation of attention is automatic and does not require willpower to maintain; what individuals experience is "effortless" concentration rather than compulsory self-control. The state of flow is precisely the ideal model of psychological energy investment: it is intrinsically driven, attention is allocated automatically, and intrinsic recognition naturally arises after successful task completion, thereby producing net returns on psychological capital. Flow theory also corroborates a core proposition of the present theory: a high level of attention can be entirely independent of intensive willpower mobilization and can instead be a low-energy-consumption, high-efficiency state. This complements Kahneman' s classic view that equates attention with effort, marking a deepening of the understanding of attentional mechanisms.

The above theories provide support for the psychological energy investment model at different levels. Psychological energy theory (Jung, Kahneman, and neuroscientific research on trauma) reveals the existence, finitude, and operating

mechanisms of psychological energy—namely, that attention, as a liquid asset, is the core of energy allocation and can be passively captured by unconscious processes; self-worth

Theory and self-efficacy theory respectively define the two core outputs in the model: the sense of self-worth (“fixed assets”) and the sense of self-efficacy (“psychological credit score”); self-determination theory reveals the essential distinction between autonomous motivation and controlled motivation, providing a theoretical basis for distinguishing the two investment modes; and flow theory demonstrates the automated allocation of attention and the efficient operation without the need for willpower that characterize the ideal investment state. The organic integration of these theories constitutes a solid foundation for the theory of psychological energy investment. Next, on this basis, this paper constructs a complete model of psychological energy investment and elaborates its operating mechanism.

4 Construction of the Theoretical Model of Psychological Energy Investment and Its Operating Mechanism

Based on the theories discussed above, this paper constructs an analytical framework for the “theory of psychological energy investment” and explains its operating mechanism in detail. The model aims to reveal the complete pathway of psychological energy from source to mobilization, and from allocation to transformation. On this basis, it explains why different modes of psychological investment lead to markedly different psychological outcomes: either a healthy positive-gain cycle or the negative depletion cycle of hollow-heart disease.

4.1 Overall Structure of the Model

The theoretical model of psychological energy investment consists of four interconnected levels: the energy source layer, the energy mobilization layer, the energy allocation layer, and the energy transformation layer. Together, these four levels constitute a complete operational circuit of psychological energy.

The energy source layer is located at the very bottom of the model and is also the material foundation of the entire psychological energy system. This layer indicates that the only ultimate source of psychological energy is the material and energetic support provided by the metabolism of the individual biological organism. The energy source layer determines the size of the “principal” of the psychological energy system and is the prerequisite for all subsequent operations.

The energy mobilization layer involves two fundamentally different modes of energy activation. When an individual faces a psychological task, whether it is necessary to mortgage the sense of self-worth depends on the relationship between that task and the individual’ s intrinsic motivation. The first is the autonomous-motivation-driven mode: when the task itself is something the individual loves, identifies with, or actively chooses, biological energy can be directly

transformed into attentional investment without the mediation of willpower. This is a low-cost and highly efficient mode of energy mobilization. The second is the controlled-motivation-driven mode: the individual is compelled, required, or acting out of external

when it must be completed under external pressure, biological energy cannot be directly transformed into attention; it must be forcibly mobilized through willpower. The essence of willpower is a high-consumption mechanism for mobilizing energy, and controlled-motivation behavior itself constitutes a collateralization of the sense of self-worth.

The core mechanism of the energy-allocation layer is attention. Attention is the operating system that directs biological energy toward specific psychological tasks, and it is the necessary and direct form of allocation for psychological energy. Whether energy is allocated directly through autonomous motivation or forcibly mobilized through willpower, it ultimately requires the focusing of attention in order to accomplish cognitive processing of the task. Under the autonomous-motivation-driven mode, the allocation of attention is relatively smooth; the low-consumption state of flow is the typical manifestation of this mode. Under the controlled-motivation behavior mode, by contrast, the allocation of attention requires continuous maintenance effort: the individual must repeatedly use willpower to "pull back" attention that has wandered, and this process further increases energy consumption.

The energy-conversion layer involves the interaction between task outcomes and internal endorsement. After attention invests energy in a task and produces an outcome, the psychological system automatically calculates the return on this investment. This calculation involves two independent evaluative dimensions: the objective outcome—whether the task succeeds—and subjective endorsement —whether the individual sincerely recognizes the outcome as meaningful and as belonging to the self. The cross-combination of these two dimensions determines the ultimate profit-or-loss status of the psychological investment, thereby influencing changes in the sense of self-efficacy and the sense of self-worth.

4.2 Two Investment Modes: Autonomous-Motivation-Driven and Controlled-Motivation-Driven

Based on the model structure described above, the theory of psychological energy investment distinguishes between two fundamentally different modes of psychological investment. The autonomous-motivation-driven investment mode is investment using "principal." In this mode, the task in which the individual engages satisfies the basic psychological needs for autonomy, competence, and relatedness, and the behavior is driven by intrinsic interest, passion, or value identification. Because there is no need to mobilize willpower, this mode has no fixed cost expenditure, and biological energy is directly transformed into attentional investment. The allocation of attention is automatic, and the individual can easily enter a state of flow. The task success rate is high, and success is

naturally accompanied by internal endorsement: "This is my choice; this is my achievement." Therefore, if the task succeeds, the

The investment result is a net gain: self-efficacy and a sense of self-worth are both enhanced, forming a positive gain cycle.

If the task fails, whether the sense of self-worth is lost depends on the individual' s attribution of failure.

The controlled-motivation-driven investment model is one in which investment is made by using a "loan." In this model, individual behavior is driven by external pressure, rewards, or punishments. Because willpower must be mobilized for forced initiation, this model entails fixed costs: that is, part of one' s sense of self-worth is mortgaged, while high interest in biological energy is also paid. Allocation of attention is effortful; it must be continuously maintained and is prone to fatigue. After the task succeeds, whether the mortgaged sense of self-worth can be redeemed depends on whether the individual obtains self-recognition. If self-recognition is lacking, then the investment outcome only maintains or improves self-efficacy, while the sense of self-worth cannot appreciate and may even slowly drain away because of the continued mortgage. Failure entails a double loss: the collateral of self-worth is forfeited, self-efficacy declines, and the pattern of failure attribution determines whether the sense of self-worth suffers further loss.

4.3 Core Operating Mechanism: Feedback Loops and Dynamic Evolution

The core operating mechanism of the psychological energy investment model is the feedback loop. The outcome of each psychological investment changes the individual' s stock of psychological energy, which in turn affects the conditions and costs of the next investment. This process of dynamic evolution contains two typical feedback circuits.

Positive gain cycle: when an individual is in an autonomous-motivation-driven mode, task success brings a dual enhancement of self-efficacy and the sense of self-worth. High self-efficacy reduces the psychological cost of mobilizing attention in the future, while a high sense of self-worth makes the individual more inclined, when facing failure, to engage in protective attribution—attributing failure to external and temporary factors. This further promotes the individual' s choice of autonomously driven tasks, forming a virtuous cycle in which "the more one does, the more energized one becomes." In this cycle, psychological energy continuously accumulates, and the level of mental health continues to improve.

Negative depletion cycle: when an individual remains in a controlled-motivation-driven mode over the long term and lacks intrinsic recognition after task success, self-efficacy is maintained, but the sense of self-worth is continuously eroded. High self-efficacy leads the individual to believe that they can complete external

tasks and therefore continue to accept challenges; a low sense of self-worth makes the individual unable

···cannot accumulate a genuine sense of self-worth from success. Moreover, a lowered sense of self-worth further weakens autonomous motivation and suppresses the desire to explore, causing the individual to fall into a vicious cycle dominated by controlled motivation. When individuals rely for a long time on external standards to confirm their own value, and lack deep interaction with the real world, it becomes difficult for them to establish a stable system of value judgment through personal practice. The formation of "hollow heart disease" is precisely the result of the long-term operation of this negative cycle.

It is worth noting that these two cycles are not fixed and unchanging. Individuals can shift from a negative cycle to a positive one by changing their investment strategies—for example, increasing tasks driven by autonomous motivation, seeking meaningful connections for externally assigned tasks, and building a diversified portfolio of psychological investments.

Figure text

- **Energy-source layer**
  - Nutritional intake Sleep
  - Nutritional intake ↓ Biological organism metabolism
  - Sleep ↓ Biological organism metabolism
  - Biological organism metabolism ↓ Psychological energy investment principal
  - Psychological energy investment principal ↓ Current psychological task
- **Current psychological task ↓ Energy mobilization layer**
  - Autonomous-motivation driven ↓ No fixed cost (cash payment)
  - Controlled-motivation driven ↓ Mortgaging the sense of self-worth (loan payment)
- **Energy allocation layer**
  - Smooth attentional deployment, low consumption
  - Attention requires more willpower to sustain
- **Energy transformation layer**
  - Task outcome × internal recognition → Change in sense of self-worth
  - Task outcome × internal recognition → Change in self-efficacy
  - **Positive gain cycle**
    Autonomous motivation → success and self-recognition → simultaneous increase in sense of worth and sense of efficacy → stronger autonomous motivation
  - **Negative depletion cycle**
    Controlled motivation → success lacking recognition → sense of efficacy increases but sense of worth decreases → autonomous motivation is impaired

Figure 1. Model diagram of psychological energy investment theory

5 Theoretical Boundaries, Explanatory Power, and Limitations of the Model

5.1 Theoretical Boundaries

This model is primarily intended for university students and cognitively normal adults who possess basic capacities for self-reflection and abstract thinking. For children whose cognitive development is not yet mature, individuals with severe mental disorders (such as major depression or schizophrenia), or individuals in a state of acute stress, the cognitive-evaluative components in the model—such as "mental accounts" and "investment strategies" —may not function effectively; its applicability to these populations therefore requires further validation. In addition, this model focuses on the mechanisms by which an individual' s internal sense of value is formed and depleted, and mainly explains the formation process of the particular psychological state of "high functioning, low value." It does not attempt to explain all types of mental-health problems (such as post-traumatic stress disorder or the biological causes of anxiety disorders), nor does it address the macro-level effects of social structural factors (such as wealth inequality, social discrimination, and institutional oppression) on mental health. The model' s valid explanatory domain is limited to "the dynamic relationship between an individual' s pattern of behavioral motivation and sense of self-worth under normal cognitive functioning." With respect to temporal boundaries, the model describes medium- to long-term processes of psychological-capital accumulation or depletion (from several months to several years), rather than momentary emotional fluctuations or short-term changes in psychological state. For fluctuations in attention or emotional ups and downs over very short periods of time (such as minutes or hours), the model lacks sufficient explanatory granularity.

5.2 Explanatory Power

The core explanatory power of this model is manifested in the following three aspects:

First, it explains the paradox of the "coexistence of high functioning and low value." Traditional theories of mental health have difficulty explaining why a university student who appears outwardly outstanding and highly accomplished may simultaneously feel inwardly empty. By distinguishing two independent dimensions—"self-efficacy" (an evaluation of ability) and "sense of self-worth" (an evaluation of existential meaning)—and by using "loan payment" as a metaphor for the psychological investment pattern driven by controlled motivation, this model clearly reveals the internal mechanism by which the two can diverge: driven by controlled motivation, the individual continuously obtains external success, thereby maintaining or even enhancing self-

a sense of self-efficacy, but in this process the sense of self-worth is continually

eroded as "collateral,"ultimately producing the paradoxical state of "the stronger the ability, the emptier the inner self."

Second, it unifies the multiple pathways through which "hollow-heart disease" forms. The model does not attribute hollow-heart disease to a single factor (such as family education, academic pressure, social expectations, etc.); rather, it integrates these external factors into a unified analytical framework. Ultimately, they all exert their effects through the common pathway of "strengthening control-driven motivation and suppressing autonomy-driven motivation." This gives the model relatively strong theoretical integrative power, enabling it to provide a consistent mechanistic explanation for the formation of hollow-heart disease across different individuals and different contexts.

Third, it provides clear targets for intervention. The model not only explains "how the problem forms," but also indicates "how the problem can be solved." It positions hollow-heart disease as a "crisis of liabilities in psychological assets" rather than as "insufficient ability" or an "emotional problem," thereby deriving a clear direction for treatment. From "stopping loans" to "investing in the smallest unit of autonomy-driven motivation," it provides an operationalizable theoretical basis for psychological intervention, rather than remaining at the level of broad suggestions such as "finding oneself" or "reducing stress."

Finally, it should be noted that this model also provides a unified perspective for understanding the relationship between hollow-heart disease, anxiety, and depression. The deep roots of all three point to the long-term low operation of the sense of self-worth; the difference lies in the coping strategies adopted. Hollow-heart disease involves the individual continuously driving behavior through controlled motivation and using external achievements to maintain a sense of efficacy, while the sense of worth is continuously mortgaged and hollowed out, manifesting as "function without meaning." Anxiety occurs when the individual, under conditions of relatively low self-worth, nevertheless continues to make high-risk investments, manifesting as worry about losses. Depression, by contrast, results from repeated long-term encounters with failure: both the sense of efficacy and the sense of worth are severely damaged, and the psychological investment system loses its operational drive, manifesting as "a dual paralysis of function and meaning." The three are not separate disease entities; rather, under the same core of low self-worth, they are stage-specific expressions that arise from differences in investment patterns and outcome feedback. This framework provides a theoretical anchor for differentiated intervention.

5.3 Limitations

Although the model has a degree of theoretical innovation and explanatory power, it still has the following limitations, which await further refinement in subsequent research:

First, the operationalization and measurement of core concepts. Concepts in the model such as "psychological energy" and "fixed-asset bankruptcy state" are

all metaphorical concepts; at present, mature and widely accepted quantitative measurement tools are lacking. How to quantitatively distinguish the "degree of autonomous-motivation drive" from the "degree of controlled-motivation drive" in empirical research, and how to assess the specific levels of "the amount of self-worth pledged as collateral" and "psychological internal friction," constitute the primary challenges facing model validation. Subsequent research needs to develop corresponding scales or experimental paradigms in order to test the model' s core assumptions.

Second, the issue of mechanistic simplification in the model. In pursuit of theoretical clarity, the model necessarily simplifies real-world situations. For example, it simplifies psychological tasks into the binary outcome of "success/failure," whereas in reality task outcomes often lie on a continuum; moreover, the same task may simultaneously contain both autonomous and controlled motivational components, and individuals may also undergo dynamic transitions in motivation type during the same task process. In addition, the model insufficiently incorporates variables such as "social support," "quality of interpersonal relationships," and "cultural background," which may limit its applicability across different groups and different cultural contexts.

Third, insufficient empirical validation. The current model is still at the stage of theoretical construction, and its core propositions—such as "controlled-motivation drive necessarily pledges self-worth as collateral" and "success under autonomous-motivation drive necessarily produces a dual enhancement" —have not yet undergone systematic empirical testing. The causal pathways proposed by the model, such as "long-term controlled-motivation drive → continuous erosion of self-worth → formation of hollow-heart disease," still need to be verified through longitudinal tracking studies or experimental research. In addition, the effectiveness of the model' s proposed "intervention pathway" ("stopping loans → minimum-unit autonomous investment → repairing fixed assets") also awaits testing in clinical or intervention studies.

Fourth, the issue of individual and cultural differences. The model' s consideration of individual differences is concentrated mainly on differences in the "principal" at the energy-source layer, but it still does not sufficiently integrate psychological individual differences such as cognitive style, personality traits, and attachment type.

Fifth, the model does not adequately describe temporal dynamics. Although it distinguishes between two feedback loops—the "positive gain cycle" and the "negative depletion cycle" —it lacks precise descriptions of dynamic features such as the "critical point"of these feedback loops. For example, the model is currently unable to provide definite answers to questions such as: "After the sense of self-worth falls below what threshold in the negative cycle will the individual enter an irreversible state of decline?" and "What is the minimum unit of investment, sustained for how long, that is required to shift from a negative cycle to a positive cycle?"

6 Summary and Outlook

In summary, the psychological energy investment model proposed in this study constructs a four-layer analytical framework consisting of the "energy-source layer—energy-mobilization layer—energy-allocation layer—energy-transformation layer." It distinguishes self-efficacy and self-worth as relatively independent psychological constructs, and uses the metaphors of "cash payment" and "loan payment" to differentiate two modes of psychological investment: one driven by autonomous motivation and the other by controlled motivation. In doing so, it provides a mechanistic explanation for the core paradox of "high functioning, low value" in college students' hollow-heart disease. The model reveals that, in the long-term process of using controlled motivation as the driving force, an individual' s sense of self-efficacy can be maintained or even continuously enhanced, while the sense of self-worth, which serves as the "collateral" for each psychological investment, is continuously eroded and fails to receive effective repair, ultimately leading to a state of "bankruptcy of fixed assets in the psychological account." On this basis, the model further depicts the self-reinforcing mechanism of the negative depletion cycle: low self-worth weakens autonomous motivation and suppresses the desire to explore, making the individual increasingly dependent on behavior driven by controlled motivation. When individuals rely for a long time on external standards to confirm their own value, lack deep interaction with the real world, and find it difficult to establish a stable system of value judgment through embodied practice, the hollowing-out of their sense of value is further intensified, forming a vicious cycle in which "the more one does, the emptier one becomes." The main theoretical contribution of this model lies in repositioning the etiology of hollow-heart disease from the traditional notions of "insufficient ability" or "emotional distress" to an "imbalance in the structure of psychological assets," and by

This yields a clear intervention pathway: genuine recovery does not lie in pursuing more external success, but in reducing the "borrowing" behaviors driven by controlled motivation, acknowledging the bankrupt state of the psychological account, and reinvesting, at the smallest unit, in "autonomous motivation," so as to gradually repair the "fixed asset" of self-worth. In this way, it provides an operable theoretical basis for mental health education and intervention among university students.

It should be noted, however, that under a controlled-motivation-driven model, the individual' s behavior is essentially a response to external pressure or expectations rather than being based on deep interaction between the authentic self and the world. Such individuals are not acting because "I want to do this," but because "I have to do this" or "I should do this." In this state, even if individuals continue to complete tasks and obtain external achievements, their attention remains directed toward external evaluative standards and reward-punishment rules; they fail to engage in genuine, "present" dialogue with and integration of their own experience, and therefore find it difficult to transform external behavioral outcomes into internal value identification. At the same

time, although mainstream social values are widely present and continue to exert influence on individuals, under the dominance of controlled motivation these values are more often passively accepted by the individual as external discipline, rather than internalized as a genuine part of the individual' s spiritual world through autonomous choice, deep experience, and reflection. Individuals may "know" what society advocates, yet may not necessarily "identify with" or "feel" the profound connection between these values and their own life experience. As a result, individuals may externally comply with social norms and achieve success in a worldly sense, while their internal world of values becomes increasingly hollow because it lacks genuine interaction and internalization. Precisely for this reason, the core significance of the "autonomous motivation investment" emphasized by this model lies in requiring individuals to return to their authentic needs and interests, allowing behavior to take root once again in direct contact between the individual and the world, thereby providing the psychological preconditions for the genuine internalization of values. This understanding further strengthens, at the theoretical level, the explanatory depth of this model regarding the mechanism by which hollow-heart syndrome forms, while also suggesting that the fundamental focus of intervention does not lie in instilling some predetermined value content, but in restoring the individual' s capacity to interact authentically with the world in a manner driven by autonomous motivation.

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Note: Figure translations are in progress. See original paper for figures.