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Physical Self Negotiation in the Digital Age: An Embodied Cognition Perspective

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Abstract: *Digital media has been deeply embedded in the daily lives of contemporary youth, where individuals inhabit both editable digital body representations and irreducible physical bodies, making the construction of physical self an unprecedented dynamic negotiation process. Existing studies have advanced independently along three threads: Physical self and body image, digital media and physical experience, and embodied cognition and physical activity, yet an integrated analytical framework connecting the three is still absent. This paper systematically reviews core literature across the three domains, proposes the integrated concept of Physical Self Negotiation defined as the dynamic process where individuals interpret, select, and integrate their bodily perceptions between digital and physical experiences, summarizes four typical negotiation strategies (assimilation, separation, resistance, and integration), and constructs the Digital-Embodiment Negotiation Model（DENM）, clarifying that physical activity serves as the core resource for embodied resistance. This paper further identifies four major research gaps: the absence of a process perspective, the binary division between digital and embodied bodies, the neglect of physical activity, and insufficient qualitative evidence targeting youth. Based on this, it puts forward a future research agenda covering measurement development, qualitative exploration, dynamic mechanism testing, and application transformation, providing a conceptual foundation for youth physical self and health promotion research.*

Keywords: *Digital Body, Body Image, Digital Media*

1. Introduction

Digital technologies have been deeply embedded in the daily lives of contemporary youth. From image performance on social media and instant retouching via beauty cameras, to quantitative tracking on fitness applications and digital avatars in virtual worlds, individuals' bodily experiences are being overlaid, and even overridden, by a completely new form of digital body. The body is no longer merely the physical entity one inhabits, but has also become a symbolic object that can be edited, uploaded, liked, and compared. Existing studies have revealed multiple forms of self-alienation in digital communication [1], pointed out the systematic shaping of body image by technology [2], and empirical findings have further clarified the generation mechanism of negative body image among youth in social media contexts, confirming the reinforcing effect of digital interactions on individuals' body surveillance and body dissatisfaction [3]. However, the physical body has not vanished amid the wave of digitalization. The tangible experiences of gasping, soreness, and the release of strength during physical exercise constitute embodied experiences that cannot be reduced to data and images. A persistent tension has emerged between the editability of the digital body and the irreducibility of the real body: young people not only pursue idealized body images in digital spaces, but also constantly return to embodied perception through physical activity, re-anchoring their self-identity in real lived experiences. This tension resonates with the longstanding debate over "disembodiment" and "embodiment" in cognitive science, where the embodied cognition perspective that cognition is rooted in the body's sensorimotor experiences [4] provides a critical analytical framework for understanding the self-constructive role of bodily experiences.

While existing research has generated rich findings along three distinct pathways, physical self and body image, digital media and bodily experiences, and embodied cognition and physical activity, there remains a persistent lack of integrative conceptual tools. This paper takes Physical Self Negotiation as the core concept to conduct a systematic review of the three research strands, and further proposes the Digital-Embodiment Negotiation Model (DENM), aiming to provide a new conceptual foundation for understanding the physical self in the digital era and its intrinsic connection with sports health promotion.

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2. Review of Three Research Strands

2.1. Physical Self and Body Image: Conceptual Genealogy and Theoretical Models

Physical self refers to an individual's cognition and evaluation of their own body, and it constitutes a core component of the self-concept. The multidimensional and hierarchical self-concept model proposed by Shavelson et al. laid the theoretical foundation for this field, explicitly defining physical self as an independent subdomain under non-academic self-concept, alongside emotional self and social self [5]. Fox and Corbin further developed the Physical Self-Perception Profile, which breaks down the construct into dimensions including physical attractiveness, sporting competence, physical strength, and physical condition, and highlights its hierarchical association with global self-esteem [6]. The Physical Self-Description Questionnaire developed by Marsh et al. further operationalizes physical self into 9 specific dimensions and 2 general dimensions [7], and subsequent studies have verified its stable correlation with external objective indicators such as body composition and physical activity levels [8].

Research along this pathway collectively demonstrates that physical self is a multidimensional, measurable structure, in which physical-activity-related dimensions (sporting competence, endurance, activity level, etc.) occupy an independent position. It also clearly distinguishes two categories of bodily perception: appearance-oriented experiences targeting external physical form, and functional experiences targeting action efficacy, which provides a fundamental reference for the intervention of kinesiology in body research and for understanding the heterogeneity of bodily experiences in the digital age.

The psychopathological line of research centered on body image has advanced in parallel with physical self researches. Body image encompasses an individual’s perceptual, cognitive, affective and behavioral experiences related to their body, and body dissatisfaction is a key risk factor for psychological problems such as eating disorders and depression. The current mainstream explanatory frameworks for body dissatisfaction include the sociocultural model that emphasizes the aesthetic pressure from media, family and peers [9], three core theoretical models for eating disorder prevention systematically sorted out by domestic scholars [10], and the dual-path model verified by longitudinal studies, which identifies dietary restriction and negative affect as two distinct mediating pathways [11]. This research tradition boasts a mature measurement system, yet it has long centered on static body evaluation and dissatisfaction, with insufficient attention to the dynamic process in which individuals actively adjust their bodily experiences. Moreover, most of its core theories were developed under the context of traditional one-way media, so whether these frameworks can be directly adapted to the highly interactive, editable digital environment remains to be tested.

Research on the physical self has yielded well-established concepts and measurement tools, yet it rests on an implicit premise: the relatively stable offline physical body. When individuals receive two parallel, potentially conflicting experiential inputs—the digital body and the physical body—simultaneously, existing frameworks struggle to explain the dynamic process through which individuals make trade-offs and negotiate between these two sources of information.

2.2. Digital Media and Bodily Experience: Three Major Research Progress Threads

This topic originates from the classic proposition of mass media and adolescent body image, where the aesthetic appearance pressure conveyed by media is a core risk source for body dissatisfaction and eating disorders [12]. After the popularization of social media, relevant studies have reached a stable consensus: social platform use is significantly correlated with body image concerns and eating disorder symptoms, with appearance-based social comparison, ideal image internalization and self-objectification as the three core mediating pathways, while high media literacy and body appreciation can exert protective effects [13-14]. Specialized studies on mainstream overseas platforms have also verified the robustness of this conclusion [15-16]. Domestic research similarly shows that body-related discussions on social media are significantly positively correlated with college students' body dissatisfaction, with self-objectification playing a mediating role and BMI playing a moderating role [17]. Subsequent studies have broken through the "passive reception" assumption, finding that adolescents adopt differentiated coping strategies when processing relevant information: passive browsing is more likely to trigger upward social comparison, while active posting carries the dual motivations of self-presentation and self-monitoring [18].

The bodily impact of digital media goes far beyond information reception, and is deeply embedded in daily productive practices. Hall et al. summarized this contradiction with the concept of "selfie paradox": young women who post selfies more frequently actually have lower body image levels. While

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creating idealized digital images, individuals are more deeply involved in social comparison and self-monitoring under platform mechanisms [19]. Domestic research further points out that in the social media context, body image has shifted from a "given existence" to an "editable technical product". Beauty filter tools and like-based interactions jointly trap young women in continuous appearance scrutiny, giving rise to a large number of negative body images [2-3].

Beyond visual modification, digital technology also reconstructs bodily experiences through quantitative tracking and virtual avatars. Fitness applications break down physical activities into quantifiable indicators, turning the body into an object that can be measured and optimized. When individuals pursue data improvement, there is an alienation risk that their subjectivity yields to technological logic [1]. Studies on "avatar-self fusion" have confirmed that the sense of ownership and agency generated by manipulating virtual avatars will reversely act on real-life self-cognition [20]. Long-term use of the digital body as an experiential reference will weaken individuals' connection with real embodied experiences, which is exactly the experiential premise for the emergence of Physical Self Negotiation.

Two parallel narratives have been formed in this field: one is the discipline and alienation narrative, which emphasizes the surveillance and data-driven reconstruction of the body by digital technology; the other is the agency and empowerment narrative, which focuses on users' strategic coping practices. Both strands have accumulated abundant findings, yet the dynamic adjustment process of individuals between the digital body and the real body has never been fully theorized.

2.3. Embodied Cognition and Bodily Experience: Theoretical Foundations and Empirical Evidence

Embodied cognition argues that cognitive processes are not disembodied information processing, but are rooted in the body's sensorimotor experiences. Ye systematically elaborates the core viewpoint of this intellectual trend: cognition is both embodied and situationally embedded, and the structure and movement patterns of the body directly shape the content and process of cognition. This turn is regarded as a landmark transformation of cognitive science from the disembodied mind view to the embodied mind view [4]. At the mechanism level, academia further distinguishes three types of embodied theoretical models: conceptualization, replacement and constitution, which provides an analytical framework for explaining the path of bodily experiences intervening in psychological processes [21], and also opens a theoretical entry for understanding the internal mechanism of how physical activities reshape psychology.

From the phenomenological perspective, the body is not a passive cognitive object, but the core subject that generates experiences. Ye explicitly proposes that the body in movement is a "lived body" rather than an "objectified body". In movement experiences, individuals interact with the world as bodily subjects, and obtain a form of self-affirmation that cannot be reduced to images or data [22]. This judgment provides a theoretical fulcrum for understanding "embodied resistance": when the digital body reconstructs perception in an editable, objectified form, movement practice precisely offers a core path for individuals to return to the subjectivity of their original physical body.

Empirical studies provide clear support: the randomized controlled trial conducted by Zhu and Wen shows that a 10-week basketball movement intervention can significantly improve positive body image among female college students. This effect is realized through the chained mediating pathway of embodied experience and self-compassion, confirming that the core benefit of physical activities lies in the restoration of embodied experience, rather than merely changes in physical appearance [23]. This indicates that physical activity is a key embodied resource to resist the alienation of the digital body.

Is digital technology weakening the dominant position of embodied agency? Gangopadhyay and Pichler point out that digital interactions have evolved new forms of agency that cannot be fully explained by the traditional embodied framework [24]. Ciaunica et al. found that heavy digital use will weaken the connection between individual self and the real physical body [25]. These studies show that digital environments do reshape the experiential foundation of physical self, yet its direction and underlying mechanisms remain to be clarified.

Embodied cognition provides core theoretical support for "returning to the body through movement", and exercise intervention studies offer preliminary empirical evidence. However, digital bodily experience and embodied practice have long been studied in isolation, and there is still a lack of an integrated framework to explain how the two interact in individual experience.

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3. Review and Controversies

3.1. Disconnection of Three Research Threads

A clear internal discontinuity can be observed by integrating the three aforementioned research lines: physical self studies take the stable offline physical body as the default context, focusing on the structure and measurement of body evaluation; digital media studies explore bodily representations and their psychological impacts in digital environments, yet generally overlook the functional logic of real bodily experiences; embodied cognition and movement studies focus on demonstrating the positive value of physical activities, but rarely incorporate the brand-new bodily context shaped by digital media into their analysis. The three categories of research address respective sub-topics, yet fail to respond to the core bodily dilemma of contemporary youth: when the editable digital body and the irreducible real body coexist, how individuals complete self-positioning and identity anchoring. The root cause lies in that the existing disciplinary division of labor splits bodily topics into three independent fields, and there has long been a lack of a procedural core concept that can cover both digital representations and real embodied experiences.

3.2. Core Controversies

Three key controversies exist in the current field. First, the binary opposition presupposition between disembodiment and embodiment: the two are actually closer to a continuum rather than opposing poles. Digital interactions themselves also contain bodily elements such as tactile and kinesthetic sensations, while movement experiences are similarly mediated and shaped by sociocultural factors [24]. Second, the cognitive opposition between passivity and agency: the disciplinary narrative regards individuals as passive recipients of technology, while the agency narrative overemphasizes users' strategic resistance [18], and the two processes often coexist in the same practical scenario [19]. Third, the directional controversy over media effects: the impact of social media on body image shows significant individual differences, and existing research still lacks a sufficiently refined explanatory model of regulatory mechanisms [14]. Most of the existing evidence comes from cross-sectional correlation studies, which is still insufficient to determine the action direction and boundary conditions of digital media effects.

3.3. Research Gaps

Based on the above review, four research gaps can be identified. First, the absence of a process perspective: existing studies are dominated by the "exposure-outcome" paradigm, and rarely examine the negotiation processes and strategies of individuals processing bodily information. Second, digital and embodied experiences are studied in isolation: few studies examine digital bodily experience and real bodily experience simultaneously under the same framework. Third, the absence of movement practice: physical activities are only used as background variables or intervention methods in digital body research, and their theoretical status as an embodied resistance mechanism has not been clarified. Fourth, insufficient qualitative evidence on Chinese youth: Western studies are mostly quantitative, and narrative and processual evidence of youth groups' body negotiation in the Chinese context is extremely scarce.

4. Conceptual Construction of Physical Self Negotiation

4.1. Concept Definition

Based on the above review, this paper proposes the integrated core concept Physical Self Negotiation, defined as a dynamic process in which individuals interpret, select and integrate their own bodies between digital bodily representations and real bodily experiences. This concept includes three key points: first, negotiation occurs between two types of bodily experiences, rather than within a single medium or a single body; second, negotiation is fully procedural, covering links such as attention allocation, meaning interpretation, strategy selection and experience integration; third, the outcome of negotiation is not static satisfaction or dissatisfaction, but a dynamic physical self state. This definition advances body research from "evaluation orientation" to "process orientation", restoring individuals from passive recipients of technology to active constructors of experience.

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4.2. Discrimination from Adjacent Concepts

Physical Self Negotiation has clear boundaries with existing adjacent concepts: different from pathology-oriented body image disturbance, it covers the continuum between health and pathology, focusing on individual coping processes rather than disturbance outcomes; compared with the agency coping research [18], it places coping in the dual digital-embodied experience structure, highlighting movement practice as the core negotiation resource; unlike the self-alienation concept [1][11], it retains complete subjective space, simultaneously accommodating multiple possibilities of subjectivity transfer, resistance and experience integration; compared with the protective filtering concept in body image research, it emphasizes cross-experiential domain active integration rather than single-dimensional information filtering.

4.3. Four Types of Negotiation Strategies

Based on the typological synthesis of existing literature, this paper extracts four non-mutually exclusive strategies for Physical Self Negotiation (see Table 1): the assimilation strategy transforms the real body according to the digital body standard, which is the behavioral expression of ideal image internalization [14]; the separation strategy actively distinguishes the digital body from the real body, embodied as selective avoidance of social comparison cues [18]; the resistance strategy confronts digital aesthetic standards with real embodied experiences, with movement practice and function appreciation as its core realization forms [22-23]; the integration strategy incorporates two types of experiences into a unified self-narrative, correcting digital self-cognition with real bodily feelings, which is the concrete manifestation of media literacy-based reflection [14]. Individuals can switch strategies across contexts, and the selection process is moderated by factors including gender, physical activity level, embodied experience sensitivity and media literacy. This matching relationship serves as a key entry point for future empirical testing.

Table 1: Types of strategies for Physical Self Negotiation.

Strategy	Core meaning	Typical manifestations
Assimilation	Reshaping the real body to conform to digital body standards	Working out to match filtered images, following influencer body ideals
Separation	Treating the digital body and the real body as distinct	Distinguishing “the online me” from “the real me”, selectively avoiding comparisons
Resistance	Countering digital body standards with real body experience	Physical activity practice, body functionality appreciation, refusing appearance comparisons
Integration	Integrating both types of experience into a unified self-narrative	Correcting digital self-perception with bodily feelings, media literacy reflection

5. Digital-Embodied Negotiation Model (DENM)

As shown in Figure 1, the DENM operationalizes the preceding Physical Self Negotiation concept into a testable theoretical framework, consisting of three core modules (input end, negotiation process, output end) and four moderating variables.

The input end refers to digital body stressors, covering four typical stimuli: social media appearance comparison cues, beautification-generated idealized body representations, quantified metrics from fitness apps, and virtual avatar environments. The negotiation process corresponds to four strategies (assimilation, separation, resistance, integration), where individuals make strategy choices amid the experiential tension between digital bodies and real bodies. The output end includes three categories of outcomes: physical self-evaluation (body image, body appreciation, body satisfaction), physical activity participation (exercise behavior, exercise adherence), and mental health (self-compassion, anxiety and depressive symptoms). Four moderators—gender, physical activity level, embodied experience sensitivity, and media literacy—are incorporated to explain individual heterogeneity in strategy selection.

The core theoretical proposition of the model is that movement and physical activity are the core practical resources for embodied resistance. Regular physical activity restores bodily sense of agency, enhances function appreciation, and improves embodied experience sensitivity, providing an empirical foundation for individuals to shift from assimilation/separation strategies to resistance/integration strategies. This logic is empirically supported by the chained mediation effect of embodied experience

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and self-compassion in movement interventions [23], and aligns with the phenomenological tradition that frames movement as a generative channel for bodily subjectivity [22]. This shift is not a one-time cognitive adjustment, but a dynamic process gradually accumulated through repeated bodily practices.

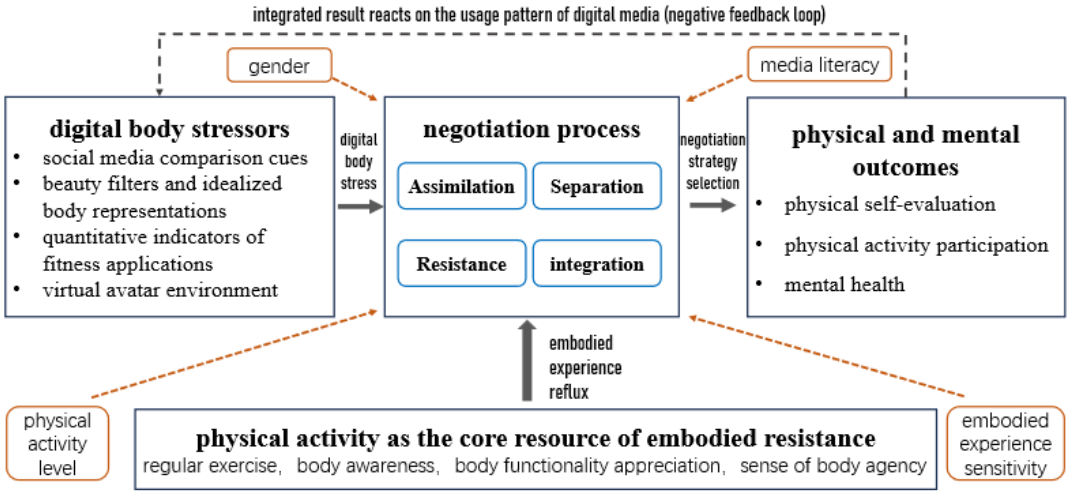


Figure 1: Digital-Embodiment Negotiation Model (DENM) conceptual framework.

6. Future Research Agenda

Based on the preceding concepts and model, this paper proposes four research directions to inform subsequent studies.

Measurement Development: Develop a Physical Self Negotiation Scale covering dimensions of negotiation frequency, strategy use and negotiation outcomes, and test its reliability and validity among Chinese youth samples.

Qualitative Exploration: Adopt phenomenological interviews, body logs combined with digital footprint elicitation, focus on specific scenarios including beauty filters, fitness apps and social platforms to examine Chinese youth's negotiation processes, supplement local empirical connotations and optimize the strategy typology.

Causal and Dynamic Examination: Conduct longitudinal tracking and experience sampling studies based on mature measurement tools, clarify the evolutionary pattern of negotiation strategies over time and their dynamic associations with physical self, mental health and physical activity. Further carry out randomized controlled trials centered on movement interventions to causally test the embodied resistance hypothesis.

Application and Translation: Introduce the Physical Self Negotiation concept into physical education curricula and mental health education. Physical education classes can serve as institutionalized scenarios to cultivate embodied resistance capacity. The integration of movement experience and media literacy training is expected to become an effective prevention path for body image issues [10].

7. Conclusion

Young people's bodies in the digital age are in a constant state of negotiation: digital bodies carry idealized aesthetic temptations, while real bodies provide the irreducible foundation for embodied resistance. This paper takes Physical Self Negotiation as the integrated core concept, systematically sorts out three research threads of physical self, digital media and embodied cognition, summarizes four negotiation strategies (assimilation, separation, resistance, integration), constructs the DENM, and clarifies that physical activity is the core practical resource for embodied resistance. This framework still awaits subsequent systematic empirical testing, yet it opens up a new problem space for interdisciplinary research between kinesiology and psychology: understanding bodies in the digital age should not be limited to static measurement of body image, but also focus on the dynamic process where individuals complete self-anchoring between two heterogeneous bodily experiences. Meanwhile, the proposition of the Physical Self Negotiation concept also prompts researchers to re-examine the internal mechanism of

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movement interventions: physical activity is no longer merely a means to alter external body shape, but a core path to reshape individuals' negotiation resources and enhance their negotiation capacity.

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