

Analysis of Exercise Motivation and Mechanism of Continuous Participation Behavior Among New Pickleball Participants

Xiaocun Li*

Hainan Vocational University of Science and Technology, Haikou, 571126, China

*Corresponding author: qidongxiaocun@163.com

Abstract: With the rapid global proliferation of pickleball as an emerging sport integrating elements of tennis, badminton, and table tennis, an in-depth investigation into the exercise motivation and the mechanism of continuous participation behavior among its participants holds significant theoretical value for understanding patterns of public sports engagement and fostering the healthy development of emerging sports. This study aims to construct an integrative theoretical framework to systematically analyze the multidimensional structure and contextual characteristics of pickleball participants' exercise motivations, as well as their interactions, and to further elucidate the psychological-cognitive pathways, contextual reinforcement loops, and mechanisms of participation inertia underlying sustained engagement. The research findings indicate that participation motivation constitutes a dynamic system encompassing a spectrum of autonomous and controlled motivations, achievement goal orientations, efficacy perceptions, and constraint negotiation; while continuous participation relies on psychological-cognitive processes such as habit automation, self-identity construction, and attribution of experiential evaluation, as well as a self-reinforcing cycle of "skill improvement-positive feedback" shaped by the distinctive features of the sport. Ultimately, the motivation system and behavioral mechanisms are coupled through patterns such as "autonomy-habit" synergy and "social-reinforcement" maintenance, collectively shaping diverse behavioral evolution trajectories and sustained participation patterns. This study provides a systematic theoretical perspective for understanding the dynamics of participation in pickleball and similar emerging recreational sports.

Keywords: pickleball; exercise motivation; continuous participation; self-determination theory; behavioral mechanism; participation inertia.

Introduction

As an emerging recreational sport characterized by its approachable technical threshold and prominent social attributes, pickleball has yet to receive comprehensive and systematic theoretical elucidation at the academic level regarding the behavioral drivers and maintenance mechanisms of its participants. Existing studies tend to either focus on the application of general motivational theories or explore singular behavioral mechanisms, lacking an integrative analytical perspective that situates both motivational systems and sustained participation behavior within the specific context of pickleball. Therefore, systematically constructing a theory of exercise motivation for pickleball participants and delving into the internal mechanisms of their continuous participation behavior can not only fill a gap in current public sports psychology research concerning this emerging field but also provide a contextualized analytical framework for understanding how individuals transition from initial attempts to long-term engagement, highlighting clear theoretical necessity. The significance of this study lies in its integration of self-determination theory, achievement goal theory, social cognitive theory, and leisure constraints negotiation theory, aiming to transcend isolated examinations of motivation and behavior by revealing the dynamic interactions and synergistic coupling between them, thereby offering a deeper theoretical foundation for the sustainable development of emerging sports.

1. Construction of an Exercise Motivation Theory for Pickleball Participants

1.1 Multidimensional Theoretical Framework of Participation Motivation

Investigating exercise motivation requires an integrated theoretical perspective, as a single

motivational theory is insufficient to fully explain the complexity of participation behaviors in emerging sports. This study employs self-determination theory as its core foundation to identify the spectrum of autonomous and controlled motivation among pickleball participants. It simultaneously incorporates achievement goal theory to differentiate between task-oriented and self-oriented participation goals. The efficacy beliefs from social cognitive theory are introduced as key variables to explain how an individual's assessment of their ability to master pickleball skills drives their behavior. Furthermore, leisure constraints negotiation theory provides a supplementary framework for understanding how participants overcome obstacles to sustain their involvement. Consequently, this approach constructs a multidimensional motivational analysis structure encompassing psychological needs, achievement orientation, efficacy perception, and constraints negotiation.

This multidimensional framework is not a static collection of elements, but rather a dynamic explanatory system. Continuum concepts such as intrinsic motivation, external regulation, introjected regulation, and integrated regulation interweave with achievement goal orientations like mastery-approach goals and performance-avoidance goals, collectively influencing the initial stage of participation decision-making. Within this structure, sport-specific self-efficacy and leisure constraints negotiation efficacy play moderating and mediating roles, affecting the efficiency with which motivations of different qualities translate into actual behavior. The aim of this theoretical integration is to move beyond the simple categorization of motivation types and instead reveal the underlying psychological dynamics system and its interactive mechanisms that drive pickleball participation behavior.

1.2 Contextual Motivational Characteristics of Pickleball

As an emerging sport integrating elements of tennis, badminton, and table tennis, pickleball's unique sport context shapes distinctive motivational characteristics among its participants. The relative approachability of its technical threshold and the possibility of rapid skill acquisition significantly enhance beginners' perceived competence and intrinsic enjoyment, allowing mastery motivation and the experience of flow to potentially become core drivers early in sports engagement. Simultaneously, the sport's inherent format-encompassing both doubles and singles play-fosters a social interactive setting that promotes the development of relational motivation. Participants' pursuit of belongingness and team connection constitutes a distinct motivational dimension, setting it apart from individual competitive sports^[1].

The interaction between the physical and social attributes of the sports context influences the manifestation and intensity of motivation. The moderate court size and exercise intensity lower participants' physiological anxiety and body image concerns, which enables health-promotion motivation to be expressed in a more positive manner. The "friendly competition" atmosphere emphasized in pickleball culture may moderate the expression of achievement motivation, weakening purely performance-avoidance tendencies and instead encouraging task engagement aimed at combining skill refinement with social recognition. Such context-specific motivational characteristics derived from the sport's unique traits necessitate that theoretical analysis must incorporate the attributes of the sport itself as a key variable, rather than merely applying generic motivational models.

1.3 Interaction Model Among Motivational Dimensions

Various motivational dimensions do not influence participation behavior independently and in parallel; instead, complex interactions and synergistic relationships exist among them. Autonomous motivation and controlled motivation may exhibit nonlinear additive effects. For example, a high degree of intrinsic interest may buffer against the risk of participation decline following the withdrawal of external rewards. Task-oriented achievement goals typically show a positive correlation with intrinsic motivation and identified regulation, collectively fostering deep engagement. In contrast, ego-oriented goals may be associated with external regulation, potentially strengthening participation in the short term within specific social comparison contexts, though their long-term stability differs.

Constructing an interaction model of motivational dimensions requires identifying key moderating pathways and mediating mechanisms. Sports self-efficacy may play a mediating role between achievement goals and the willingness for sustained participation, as individuals with high efficacy are more likely to set challenging task goals and maintain their engagement. Social support, as a contextual factor, can moderate the internalization process from relational motivation to autonomous motivation. Constraints negotiation efficacy is regarded as a critical bridge connecting motivation to sustained

behavior; even highly motivated individuals may experience interrupted participation if they lack the efficacy beliefs necessary to cope with constraints related to time, skills, or companions. This interaction model aims to depict the dynamic balance and transformational conditions within the motivational system, clarifying which motivational combinations or interaction patterns are most likely to lead to stable, long-term participation behavior.

2. Analysis of the Internal Mechanisms of Sustained Participation Behavior

2.1 Psychological-Cognitive Pathways of Behavioral Maintenance

Sustained participation behavior is rooted in a series of interconnected and progressively deepening psychological-cognitive processes. Habit formation theory provides a fundamental explanatory framework for this, emphasizing that through the stable association between contextual cues and behavioral responses, participation decision-making gradually transitions from a rational model dependent on conscious control to an automated mode with low cognitive load. Within this transformation pathway, the intention-behavior gap is crucially moderated by the strategy of "implementation intentions." That is, participants form specific plans of "if situation X occurs, then I will perform behavior Y," anchoring abstract motivations to concrete spatiotemporal cues, thereby significantly enhancing the reliability and efficiency of behavior initiation. A more profound mechanism lies in the progressive construction of sports self-identity-when the identity of "pickleball participant" evolves from a temporary behavioral label, through social validation and self-narrative, into a stable and core component of the self-concept, maintaining behavior consistent with this internalized identity becomes a necessity for self-verification, driving long-term engagement that transcends immediate preferences^[2].

The consolidation and reinforcement of this psychological-cognitive pathway heavily rely on the online evaluation of participation experiences and retrospective attribution. Positive affective experiences, such as the sense of immersion and pleasurable mastery accompanying flow states, are assessed by the cognitive system and encoded as attractive episodic memories, forming positive expectations for the future. Simultaneously, an individual's attribution style regarding participation outcomes-whether success or setbacks-acts as a crucial moderating variable. Attributing positive outcomes to stable, internal, and controllable factors, such as improvable skills or effort, or attributing temporary setbacks to variable external circumstances, helps maintain and enhance self-efficacy, thereby reinforcing commitment to participation. This dynamic cognitive sequence, encompassing habit automation, identity internalization, experience evaluation, and adaptive attribution, collectively delineates the internal psychological pathway from casual attempts toward stable commitment.

2.2 Behavioral Reinforcement Loop within the Sports Context

Sustained participation in pickleball is supported by a behavioral reinforcement loop shaped by the sport's distinctive characteristics. This cycle begins with the immediate association between skill improvement and positive feedback. The "easy to learn but difficult to master" nature of pickleball allows beginners to quickly acquire basic rallying skills, generating an initial sense of mastery and accomplishment. This positive feedback acts as a primary reinforcer, directly increasing the frequency of participation behavior. As skills progress, participants can experience the enjoyment of executing more complex tactics and engage in higher-quality social interactions. These advanced pleasurable experiences constitute secondary reinforcement, endowing the act of participation itself with intrinsic rewarding properties.

This behavioral reinforcement loop possesses the distinctive features of being self-sustaining and positively escalating. The advancement of skill levels directly expands the social dimensions and situational possibilities for participation-for instance, gaining access to higher-level competitive circles or forming stable practice partnerships. This, in turn, facilitates integration into a richer and more stable social support network and enhances the provision of a sense of belonging. This strengthened social network, in turn, generates a gentle normative pressure and incentive of expectation, providing an external structural force for regular participation and further solidifying behavioral habits. Furthermore, the naturally intertwined elements of playfulness, moderate competition, and cooperative demands within the sport context continuously generate novel and mildly challenging stimuli. This effectively counteracts the perceptual fatigue that could arise from simple repetition, allowing the positive reinforcement cycle to operate long-term in a state of dynamic equilibrium. This mechanism reveals

how pickleball, as an activity system, naturally guides participants into an enhancement loop where depth of participation and behavioral stability mutually reinforce each other, through its inherently designed feedback structure^[3].

2.3 Formation and Transformation Mechanism of Participation Inertia

Participation inertia refers to a behavioral steady state in which engagement can persist based on the internal stability of the system, even after the intensity of the initial participation motivation may have diminished. Its formation mechanism is the product of complex coupling among multi-layered factors. From the perspective of behavioral economics, the sunk cost effect plays a role here. The prior costs accumulated by individuals in terms of time, financial investment, specialized skill learning, and emotional investment constitute a psychological "sunk cost," thereby generating a tendency to maintain participation to avoid cognitive dissonance and a sense of loss. More fundamentally, through repetition, the participation behavior becomes systematically embedded within the individual's daily life rhythm and the topological structure of their social network. It transforms into a fixed weekly schedule, a normalized social ritual, and a familiar anchor point in their living space. This structural embedding allows the maintenance of the behavior to largely bypass daily active decision-making, instead relying on the external support of established life patterns and social expectations, forming a kind of "de-motivated" persistence.

The transformation mechanism of inertia reveals the nonlinear characteristics of sustained participation. The maintenance of inertia has a threshold; when external disruptive forces exceed the system's capacity to maintain its steady state, the inertia may be broken. Disruptive factors can include major life events, the departure of core playing partners, persistent skill plateaus, or the strong appeal of alternative leisure activities. The transformation may lead to two pathways: one is negative transformation, involving interruption and cessation of participation; the other is positive transformation, achieved through actively adjusting participation patterns, setting new goals, or expanding new sports social circles to reconstruct and upgrade the inertia. Analyzing the critical points of transformation and their influencing factors helps in understanding the dynamic stability and evolutionary direction of sustained participation behavior^[4].

3. Integrated Analysis of Motivation and Behavioral Mechanisms

3.1 Motivation-Oriented Behavioral Evolution Trajectories

The qualitative composition of initial motivation profoundly shapes the long-term evolutionary path of participation behavior. Viewed through the lens of self-determination theory, autonomous motivation grounded in intrinsic interest or highly integrated identified values often guides a deepening trajectory of "exploration-immersion-internalization." In this trajectory, early exploratory behaviors driven by novelty and a sense of mastery gradually evolve into an immersive experience as sports skills become refined and athletic identity solidifies, ultimately internalizing participation behavior as a core component of the individual's lifestyle and self-concept. This process is accompanied by a further increase in the level of motivational autonomy, a significant reduction in the dependence of behavioral maintenance on contextual external rewards, and demonstrates considerable psychological resilience.

In contrast, controlled motivation primarily stemming from external regulation or introjected regulation may lead to a differential trajectory of "instrumentality-fluctuation-decision." Such participation behavior initially exhibits a distinct instrumental nature, and its stability is closely tied to the continuous availability of external reinforcements, such as social recognition or tangible rewards. When external conditions change or the internalization process of intrinsic value is hindered, participation frequency and intensity are prone to significant fluctuations. Its long-term sustainability often depends on a critical decision point: whether the participant successfully transforms external justifications into personally identified values. Therefore, the behavioral evolution trajectory is not statically predetermined but rather a psychological process of dynamic transformation and reshaping, as the motivational system continuously interacts with sports experiences, social feedback, and self-reflection.

3.2 Sustained Participation Patterns Under Mechanism Coupling

A stable state of sustained participation is, in essence, the result of effective synergistic coupling

between the intrinsic motivational system and extrinsic behavioral maintenance mechanisms. An ideal coupling form is the "autonomous-habit synergy model," characterized by the combination of high levels of autonomous motivation and highly automated behavioral habit chains. In this model, deep-seated intrinsic drive provides the direction and sense of meaning for the behavior, while the context-behavior habits formed through repetition significantly reduce the cognitive and volitional costs of action. These two elements work in synergy, forging a participation norm characterized by high stability and high psychological reward. Behavior under this model possesses considerable resistance to interference and can buffer against the impact of general life stressors^[5].

Another prevalent pattern is the "social-reinforcement maintenance model," whose core coupling point lies in relational motivation and the inherent behavioral reinforcement loop of the sports context. The participants' need for belonging and community connection serves as the primary driving force, while the regular social interactions, teamwork, and resulting positive social feedback constructed by pickleball activities form a continuous external reinforcement system. The stability of this model is highly dependent on the continuity of the specific social network and the regularity of activity organization. Although its efficacy is significant within a stable social ecosystem, compared to the "autonomous-habit" model, its resilience is relatively weaker and more susceptible to the impact of changes in core members or group dynamics. Different coupling models reveal the diverse "psychological-behavioral" steady-state structures underlying sustained participation.

3.3 Extension and Application Boundaries of the Theoretical Framework

The theoretical framework integrated in this study possesses the potential for limited extension to similar emerging recreational sports. The framework's emphasis on multidimensional motivation, the contextual characteristics of the sport, and the interactions between motivational and behavioral mechanisms provides an analytical paradigm that can inform the understanding of participation dynamics in other sports characterized by a low technical threshold, strong social attributes, and playful features, such as frisbee and land surfing. In particular, the mechanistic discussions concerning the "contextual behavioral reinforcement loop" and the "participation inertia threshold" reveal, at a micro level, how public sports programs can naturally promote user retention and deepening engagement through the design of experiential structures, offering theoretical insights for the cultivation of project ecosystems.

However, the application of this theoretical construct has explicit boundary conditions, and acknowledging these boundaries reflects theoretical rigor. Firstly, the framework is rooted in the developmental stage of pickleball within specific sociocultural contexts. For traditional sports that are highly institutionalized, competitively focused, or carry entirely different cultural connotations, the weighting and relationships of its core variables may require recalibration. Secondly, this model primarily focuses on individual psychology and proximal behavioral mechanisms, with limited inclusion of the mediating and moderating effects of distal variables such as macro socioeconomic background and structural changes across the life course. Future theoretical expansion could proceed in two directions: first, conducting cross-cultural comparative studies to examine the universality and specificity of motivational structures and coupling patterns; second, introducing a life course perspective to explore the critical transition points and differences in maintenance resources for the sustained participation mechanisms of participants at different life stages. Clarifying these boundaries aims to provide subsequent research with a precise starting point and a foundation for dialogue.

Conclusion

This study, through a systematic analysis of the exercise motivation and the mechanism of sustained participation behavior among pickleball participants, has constructed an explanatory framework that integrates multidimensional motivational theories, psychological-cognitive pathways, and contextual reinforcement mechanisms. The research confirms that sustained participation in pickleball is not merely the continuation of a single motivation or occasional behavior. Instead, it is the outcome of the continuous evolution of the initial motivation's quality and state through interaction with the sport's unique context, deeply coupled with mechanisms such as habit formation, self-identification, behavioral reinforcement, and embedding within life structures. Different motivation-behavior coupling patterns lead to distinct participation trajectories and levels of stability. This theoretical framework possesses a certain potential for extension to understanding other emerging recreational sports with similar characteristics, though its application is also constrained by specific stages of project

development and cultural contexts. Future research could deepen and expand in two directions: first, by conducting cross-cultural comparative studies to examine the universality and cultural specificity of motivational structures, behavioral reinforcement loops, and coupling patterns; second, by introducing a life course perspective to explore differences in the key resources, transition points, and intervention strategies for sustaining participation among individuals at different life stages, such as youth, middle age, and old age. This would further refine the dynamic theoretical model of public sports participation behavior.

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