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A Preliminary Empirical Study on the Impact of Social Support on PE Engagement among Chinese Non-PE Majors

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Abstract: *Under the "Healthy China 2030" strategy, enhancing college students' engagement in physical education has emerged as a significant academic priority. This study examines the structural relationships among Social Support (SS), Academic Self-Efficacy (ASE), and Physical Education Engagement (PEE), with a specific focus on the mediating role of ASE. Employing a quantitative research design, data were collected from 59 undergraduate students using validated structured questionnaires, including the PSSS, GSES, and PELES. Psychometric evaluations demonstrated excellent reliability (alpha =0.976) and robust construct validity (KMO =0.914) within the specific context of Chinese higher education. Preliminary Structural Equation Modeling (SEM) and path analysis reveal that Social Support significantly and positively predicts students' engagement in physical education both directly and indirectly through the critical mediating mechanism of Academic Self-Efficacy. These findings suggest that perceived social resources bolster students' intrinsic confidence, thereby driving their active engagement in PE classes. In conclusion, the comprehensive analytical framework developed in this study effectively elucidates the key variables and interaction paths influencing student engagement in PE classrooms, offering substantial theoretical and practical implications for physical education reform. Furthermore, it provides university educators with practical insights to optimize supportive instructional strategies, ultimately fostering the long-term physical literacy of Chinese university students.*

Keywords: *Social support, Academic self-efficacy, Physical education engagement, Student engagement*

1. Introduction

1.1 Research Background and Problem Statement

Despite the institutionalization of physical education (PE) in Chinese higher education, a significant gap persists between policy directives and practical implementation. Many universities treat PE as a formality, leading students to perceive it as a "utilitarian task" rather than a meaningful learning experience. This results in widespread covert disengagement, where students are physically present but emotionally and cognitively detached[1].

Student engagement in PE is a multidimensional construct comprising behavioral (participation), emotional (interest), and cognitive (investment) components[2]. In practice, behavioral engagement is often reduced to passive complianc[3], while emotional engagement is stifled by anxiety or indifference[4]. Cognitive engagement often remains at a superficial level, where students focus on task completion rather than engaging in deep cognitive processing and meaningful understanding[5].

This disengagement is frequently rooted in a deficit of perceived social support (SS) from teachers, peers, and family, which serves as a vital buffer for emotional security and self-efficacy[6]. Teacher support is often sidelined by technical instruction; peer support is hindered by social exclusion; and family support is weakened by the prioritization of "core" academic subjects[7]. Consequently, there is an urgent need to examine how social support can be leveraged via academic self-efficacy (ASE) to rebuild student engagement.

1.2 Theoretical Framework and Research Gaps

This study integrates Self-Determination Theory (SDT), Basic Psychological Needs Theory (BPNT), and Self-Efficacy Theory to decode these motivational barriers. Social support fosters engagement by

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satisfying innate needs for autonomy, competence, and relatedness, while ASE acts as a pivotal mediator that bolsters students' belief in their capabilities[8].

Despite extensive literature, three structural gaps remain:

Conceptual Oversimplification: Studies often equate engagement with mere attendance.

Theoretical Fragmentation: A lack of systematic frameworks elucidating the specific psychological mechanisms in PE.

1.3 Research Objectives and Hypotheses

The primary objective is to investigate the mediating role of ASE in the relationship between SS and student engagement among university students in Henan Province, China. Specifically, the study tests:

H1: SS has a significant positive relationship with student engagement (SE).

H2: SS has a significant positive relationship with ASE.

H3: ASE has a significant positive relationship with SE.

H4: ASE mediates the relationship between SS and SE, exhibiting both direct and indirect effects.

1.4 Conceptual Model

The conceptual framework (Figure 1) posits that social support (comprising teacher, peer, and family dimensions) serves as the environmental antecedent for SE, with ASE functioning as the internal psychological mechanism that translates support into multi-dimensional engagement. The conceptual framework for this study is shown in Figure 1.

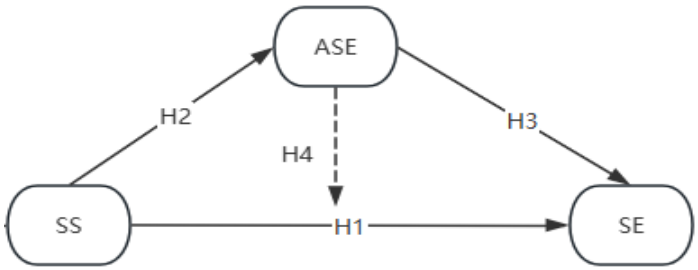

Figure 1 Conceptual Model of Social Support, Academic Self-Efficacy, and Student Engagement

1.5 Significance of the Study

This research offers theoretical contributions by constructing an integrated SDT-based model for PE and provides pedagogical implications for instructors to design student-centered classrooms. Methodologically, it employs an explanatory sequential mixed-methods design, triangulating structural equation modeling (SEM) with qualitative insights to capture the dynamic nuances of the student experience, thereby providing practical value for institutional support systems in China.

2. Literature Review and Theoretical Framework

2.1 Theoretical Foundations

This study integrates Self-Determination Theory (SDT) and its sub-theory, Basic Psychological Needs Theory (BPNT), to explain the motivational mechanisms in Physical Education (PE). SDT posits that students exhibit higher intrinsic motivation and sustained engagement when their innate needs for autonomy, competence, and relatedness are satisfied[3][8]. In PE settings, social support from teachers, peers, and family serves as the environmental antecedent that fulfills these needs, facilitating the transition from external regulation to integrated identity[9]. Complementing this, Self-Efficacy Theory

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identifies academic self-efficacy (ASE) as a direct psychological manifestation of competence need satisfaction, which directly bolsters students' effort and persistence[10][11].

2.2 Multidimensional Student Engagement in PE

Academic Engagement (AE) in PE is a multidimensional construct comprising behavioral (participation), affective (interest), and cognitive (strategy application) components[12]. While prior research linked AE to positive learning outcomes, current PE instructional designs often overemphasize performance over psychological needs, leading to "passive presence" or covert disengagement[4][8]. High levels of engagement in PE not only improve motor skills but also mitigate anxiety and enhance socialization[13].

2.3 Social Support as an Environmental Catalyst

Social Support (SS) is conceptualized as the perceived availability of emotional, informational, and material assistance from one's social network[14]. In educational contexts, teacher support, peer support, and family support are critical drivers of student motivation[15][16]. Supportive teacher behaviors reduce psychological barriers, while peer reciprocity satisfies the need for relatedness, collectively enhancing multidimensional engagement[17]. However, research often examines these sources in isolation, neglecting their synergistic effects in collectivist cultures like China[18].

2.4 The Mediating Role of Academic Self-Efficacy

Academic Self-Efficacy (ASE) reflects students' beliefs in their capability to succeed in PE tasks (Bandura, 1977). As a pivotal mediator, ASE translates external social resources into internal drive. Perceived support fulfills the need for competence, providing the mastery experiences necessary to bolster ASE[19]. Students with high ASE demonstrate greater resilience and proactive learning behaviors, even in high-challenge PE contexts [20].The specific dynamics in physical education classes, characterized by public performance and comparison among peers, have received little attention in research, especially among non-physical education major students in China, who often consider this subject unimportant[21].

2.5 Summary and Research Gaps

In summary, while the links between social support, self-efficacy, and engagement are theoretically grounded in SDT. Contextual Specificity: Most studies focus on general academics, overlooking the unique performative and interactive nature of PE classrooms. Mechanistic Depth: There is a lack of integrated models exploring the indirect pathways from multiple support sources to multidimensional engagement via ASE. Cultural Adaptation: Existing literature is predominantly Western-centric, failing to capture the nuances of support and efficacy in Chinese collectivist education. The present study addresses these gaps by adopting an explanatory sequential mixed-methods design, utilizing quantitative SEM to test structural relationships and qualitative interviews to explore the subjective psychological experiences of Chinese university students.

3. Research methodology

3.1 Research Design

This study employs a cross-sectional quantitative research design to examine the structural relationships between perceived social support, academic self-efficacy, and student engagement in physical education (PE) classes among Chinese university students. The research follows a deductive approach, testing a mediation model where academic self-efficacy is hypothesized to link environmental social support to students' engagement behaviors.

3.2 Participants and Sampling

Target Population: Undergraduate students from public universities in Henan Province. Pilot Study Sample: A sample of 59 students was recruited from Henan Normal University and Xinxiang University for the instrument validation phase. Sampling Method: Stratified random sampling was used, with strata

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defined by year of study (Year 1 to Year 4) and major (non-PE majors).The socio-demographic characteristics of the participants, including gender, major, and parental income, are summarized in Table 1.

Table 1. Frequency Distribution of Demographic Characteristics (n=59)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	31	52.542
	Female	28	47.458
	Total	59	100
Year of Study	Year 1	13	22.034
	Year 2	16	27.119
	Year 3	17	28.814
	Year 4	13	22.034
	Total	59	100
Place of Origin	Urban	36	61.017
	Rural	23	38.983
	Total	59	100
Major	Science & Engineering	32	54.237
	Humanities & Social Sciences	27	45.763
	Total	59	100
Father's Education Level	Junior High School or Below	3	5.085
	High School / Vocational / Technical School	5	8.475
	Associate Degree	15	25.424
	Bachelor's Degree	31	52.542
	Master's Degree or Above	5	8.475
	Total	59	100
Mother's Education Level	Junior High School or Below	3	5.085
	High School / Vocational / Technical School	6	10.169
	Associate Degree	20	33.898
	Bachelor's Degree	22	37.288
	Master's Degree or Above	8	13.559
	Total	59	100
Household Income Level	Low (Annual Income < 30,000 RMB)	4	6.78
	Lower-Middle (Annual Income 30,000–60,000 RMB)	20	33.898
	Middle (Annual Income 60,000–120,000 RMB)	17	28.814
	Upper-Middle (Annual Income 120,000–250,000 RMB)	16	27.119
	High (Annual income of more than 250,000 RMB)	2	3.39
	Total	59	100

3.3 Measurement Instruments

The survey instrument comprises three validated scales adapted for the Chinese PE context:

Perceived Social Support Scale (PSSS): Revised by Jiang (2001), this 12-item scale measures support from family, friends, and teachers.

Academic Self-Efficacy Scale: A 5-item scale developed by Chi (2017) to measure students' confidence in their academic abilities.

Physical Education Learning Engagement Scale (PELES): A 14-item scale revised by Yang (2024) covering behavioral, cognitive, and emotional engagement.

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3.4 Data Collection and Analysis Strategy

Data were collected via "Wenjuanxing," a professional online survey platform. Statistical analysis was conducted using SPSS 26.0 and AMOS 26.0. The analysis proceeded through: Reliability Analysis: Calculation of Cronbach's alpha. and Corrected Item-Total Correlation (CITC).

Validity Analysis: KMO measure and Bartlett's Test of Sphericity. Structural Path Analysis: Preliminary testing of the relationships among the three core variables.

4. Results and findings

4.1 Reliability Analysis

The internal consistency of the instruments was evaluated using Cronbach's alpha. All constructs demonstrated high reliability, with coefficients exceeding the recommended threshold of 0.70.

Table 2. Reliability Analysis Results for the Overall Scale (n=59)

Reliability Summary Format		
Cronbach Alpha	Sample Size (N)	Number of Items
0.976	59	31

Based on the overall reliability coefficient, the standardized Cronbach's α is 0.976, indicating that the questionnaire demonstrates excellent internal consistency and very high overall reliability, and the results are summarized in Table 2.

Behavioral Engagement: alpha = 0.794. Cognitive Engagement: alpha = 0.922..Emotional Engagement: alpha = 0.810..Academic Self-Efficacy: alpha = 0.871..Social Support: alpha = 0.962.

4.2 Validity Analysis

Construct validity was confirmed through KMO and Bartlett's tests. The KMO value of 0.914 indicates excellent sampling adequacy, and the significant Bartlett's test ($X2 = 1693.114$, $p < 0.001$) confirms the data is suitable for factor analysis.

4.3 Structural Path and Mediation Analysis

The preliminary SEM analysis indicates that social support positively predicts academic self-efficacy, which in turn enhances student engagement in PE classes. The technical route and data analysis procedure of this study are illustrated in Table 3.

Table 3. Flowchart of Research Procedures and Quantitative Data Analysis

Phase	Procedure	Outcome
Quantitative Data Collection	• Distribution of structured questionnaires to undergraduate students • Measurement of perceived social support, academic self-efficacy, and student engagement • Data collection conducted in the quantitative phase	• Numeric dataset • Completed questionnaires suitable for statistical analysis
Quantitative Data Analysis	• Data screening (missing values, outliers, normality testing) • Descriptive statistics analysis • Pearson correlation analysis • Confirmatory Factor Analysis (CFA) • Structural Equation Modelling (SEM) • Mediation analysis using bootstrapping	• Descriptive statistical results • Validated measurement model • Structural relationships among variables • Tested mediating effect of academic self-efficacy

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5. Conclusion and recommendations

5.1 Conclusion

This study provides preliminary empirical evidence for the structural relationships between perceived social support, academic self-efficacy, and student engagement within the context of university physical education (PE) in China. The findings successfully validated the psychometric properties of the adapted instruments, yielding excellent internal consistency ($\alpha = 0.976$) and robust construct validity (KMO = 0.914).

The results suggest that social support serves as a critical environmental catalyst. Specifically, when students perceive higher levels of support from teachers, family, and peers, their internal confidence—manifested as academic self-efficacy—is significantly bolstered. This internal belief system, in turn, acts as a psychological bridge that translates external social resources into active behavioral, cognitive, and emotional engagement in PE classes. Consequently, fostering a supportive social climate is not merely an auxiliary educational task but a fundamental requirement for enhancing students' learning quality in PE.

5.2 Theoretical Implications

This research contributes to the existing literature in two significant ways:

1) Contextual Validation: By adapting and validating the PSSS, GSES, and PELES scales for Chinese non-PE majors, this study provides a reliable measurement framework for future sports psychology research in similar cultural and educational settings.

2) Mechanism Clarification: The study reinforces the Self-Determination Theory (SDT) by demonstrating how social contextual factors (Support) satisfy the psychological need for competence (Self-efficacy), which ultimately drives autonomous motivation (Engagement).

5.3 Practical Recommendations

5.3.1 For Physical Education Instructors

Teachers are encouraged to transition from a traditional "instruction-only" model to a "supportive-teaching" model.

Teacher Support: Instructors should provide constructive, individualized feedback rather than purely technical corrections. Recognizing small improvements in students' physical skills can significantly enhance their "mastery experiences," which is the strongest source of self-efficacy.

Autonomy Support: Allowing students a degree of choice in sports activities or goal-setting can foster a sense of ownership, leading to higher emotional and cognitive investment.

5.3.2 For University Administrators and Policy Makers

Institutions should recognize that PE engagement is influenced by more than just on-campus facilities. Peer Support Systems: Establishing cooperative learning groups or sports clubs can create a peer-support network that mitigates the anxiety often felt by non-PE majors during physical performance assessments. Home-School Connection: Encouraging family interest in students' physical well-being can reinforce the value of PE beyond the classroom.

5.4 Limitations and Future Research

Although a rigorous validation process has been carried out, it must be acknowledged that there are still some limitations: Firstly, the sample size: As a pilot study, the current sample size (N=59) is relatively small. Although it is sufficient for the initial instrument validation and preliminary path exploration, it may limit the general applicability of the structural model. Secondly, the methodological scope: Due to the cross-sectional nature of the data, it is impossible to draw clear causal relationship inferences.

Future research directions suggest the use of large-scale validation. Subsequent studies should expand the sample size to 600 or more to conduct more rigorous confirmatory factor analysis (CFA) and multiple sets of consistency tests for different genders and grades. Additionally, a longitudinal design is

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recommended: future research can adopt a longitudinal tracking approach to observe how changes in teacher support throughout the semester dynamically affect fluctuations in students' self-efficacy and engagement.

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