

## VALIDATION OF THE CHINESE VERSIONS OF RSPE, PLOCQ, AND SESPE AMONG UNDERGRADUATE PHYSICAL EDUCATION STUDENTS

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### ABSTRACT

This study aimed to translate, culturally adapt, and psychometrically validate three widely used psychological instruments in physical education—the Responsibility Scale in Physical Education (RSPE), the Perceived Locus of Causality Questionnaire (PLOCQ), and the Student Enjoyment of School Physical Education Scale (SESPE)—for application among Chinese undergraduate physical education (PE) students. A systematic validation procedure was employed, including translation and back-translation, expert content validation, reliability analysis, and confirmatory factor analysis (CFA). Data were collected from 182 undergraduate PE majors recruited from universities in Hubei and Fujian provinces, China.

Expert content validation demonstrated high item-level and scale-level content validity. Internal consistency reliability was excellent across the adapted scales. Confirmatory factor analysis indicated satisfactory model fit, supporting the factorial validity of the measurement models. Overall, the findings suggest that the Chinese versions of the RSPE, PLOCQ, and SESPE exhibit sound psychometric properties.

The validated instruments provide reliable and culturally appropriate tools for assessing responsibility, motivational regulation, and enjoyment in physical education learning contexts. This study offers a methodological foundation for future research and applied evaluation in physical education and educational psychology involving Chinese undergraduate populations.

**Keywords:** Physical Education; Scale Validation; Responsibility; Motivational Regulation; Enjoyment; Chinese Undergraduate Students

### 1.0 INTRODUCTION

Understanding students' psychological experiences is fundamental to effective teaching and learning in physical education (PE). Among the psychological determinants of PE learning outcomes, responsibility, motivational regulation, and enjoyment have been consistently identified as core factors influencing students' engagement, emotional well-being, and sustained participation in physical activity (Huang & Jeong, 2025; Soos et al., 2025). From an educational psychology perspective, these constructs shape how students perceive PE lessons, respond to instructional practices, and develop positive attitudes toward lifelong physical activity.

To examine these psychological dimensions, several well-established instruments have been widely used in international PE research. The Responsibility Scale in Physical Education

(RSPE) assesses students' personal and social responsibility behaviors, including effort, respect for rules, cooperation, and autonomy (Hsu, Pan, Chou, Lee, & Lu, 2014). The Perceived Locus of Causality Questionnaire (PLOCQ), grounded in Self-Determination Theory, captures different forms of motivational regulation ranging from amotivation to intrinsic motivation (Huang & Jeong, 2025). In addition, the Student Enjoyment of School Physical Education Scale (SESPE) measures multiple sources of enjoyment associated with participation in PE lessons (Garn & Cothran, 2006; Zhang, Sun, Fan, & Deng, 2024).

Despite the international recognition of these instruments, validated versions suitable for Chinese physical education contexts remain limited. This gap restricts empirical investigation of students' psychological experiences within local curricula. Accordingly, the present study aimed to translate, culturally adapt, and preliminarily validate the RSPE, PLOCQ, and SESPE for use among Chinese undergraduate PE students (Goudas, Biddle, & Fox, 1994). A structured validation process was implemented, including translation and back-translation, expert content validation, item-level reliability analysis, and confirmatory factor analysis (CFA).

Specifically, this study sought to: 1) translate and culturally adapt the RSPE, PLOCQ, and SESPE for application in Chinese undergraduate physical education settings; 2) evaluate the content validity of the adapted instruments through expert review using quantitative and qualitative criteria; and 3) examine the factorial validity and internal consistency of the scales in a preliminary student sample using CFA.

Beyond instrument translation, this study contributes to the literature on physical education measurement and educational psychology in several ways. First, it provides empirically supported tools for assessing responsibility, motivational regulation, and enjoyment among Chinese undergraduate PE students, addressing the shortage of validated instruments. Second, by integrating these three constructs within a unified validation framework, it offers a coherent foundation for future research on students' learning experiences and psychological processes in PE (Garn & Cothran, 2006; Scanlan & Simons, 1993). Finally, the validated instruments may inform applied research and teaching practice, enabling educators to better interpret and respond to students' motivational and affective experiences in physical education settings.

## 2.0 METHOD

### 2.1 Participants

The expert panel consisted of three language experts and five content experts in physical education pedagogy, football instruction, and educational measurement. All content experts held at least an associate professorship and had more than ten years of professional experience.

The preliminary validation sample included undergraduate physical education majors recruited from universities in Hubei and Fujian provinces, China. A total of 212 questionnaires were distributed online, and 182 valid responses were retained after excluding incomplete or low-quality responses. The final sample consisted of 144 male and 38 female students aged 18–23 years, representing all undergraduate year levels.

### 2.2 Instruments

### **Responsibility Scale in Physical Education (RSPE)**

The Responsibility Scale in Physical Education (RSPE), developed by (Hsu et al., 2014), assesses students' personal and social responsibility in PE learning contexts. The scale consists of six dimensions: effort, self-direction, following class rules, respecting others, helping others, and cooperating. Together, these dimensions reflect students' behavioral engagement, interpersonal responsibility, and adherence to instructional norms during PE lessons. The RSPE has been widely applied in sport pedagogy research and demonstrates strong conceptual alignment with responsibility-based instructional models.

### **Perceived Locus of Causality Questionnaire (PLOCQ)**

Grounded in Self-Determination Theory, the Perceived Locus of Causality Questionnaire (PLOCQ) measures five forms of motivational regulation: amotivation, external regulation, introjected regulation, identified regulation, and intrinsic motivation. Each form of regulation is represented by four items, resulting in a 20-item multidimensional scale. The PLOCQ has been extensively validated and is widely used to examine students' motivational processes in educational and physical activity settings.

### **Student Enjoyment of School Physical Education Scale (SESPE)**

The Student Enjoyment of School Physical Education Scale (SESPE) evaluates students' enjoyment of PE lessons across four domains: achievement–intrinsic, achievement–extrinsic, non-achievement–intrinsic, and non-achievement–extrinsic. These domains capture both performance-related and activity-related sources of enjoyment, providing insight into students' affective engagement in PE. The SESPE has been commonly used to assess emotional responses to PE participation in youth and higher education contexts.

All three instruments employed a 5-point Likert-type scale ranging from 1 (“strongly disagree”) to 5 (“strongly agree”).

## **2.3 Translation and Cultural Adaptation Procedure**

Translation and cultural adaptation followed Brislin's (1980) translation–back translation protocol to ensure semantic, conceptual, and cultural equivalence. The procedure consisted of four stages. First, an initial Chinese translation of all items was completed by a bilingual doctoral candidate specializing in physical education. Second, a professional linguist who was unfamiliar with the original instruments independently back-translated the Chinese version into English to identify potential discrepancies. Third, an expert panel comprising two sport pedagogy scholars and one experienced PE teacher reviewed all items for clarity, cultural appropriateness, content relevance, and fidelity to the original constructs. Finally, revisions were made based on expert feedback to improve linguistic naturalness and contextual suitability.

For example, the original item “I don't laugh at my classmates' mistakes” was refined to “I don't laugh at my classmates when they make mistakes” to enhance interpretative clarity. All modifications were systematically documented in a questionnaire revision comparison chart to ensure transparency in the adaptation process.

## 2.4 Data Analysis

Expert validation was conducted to establish the content validity of the translated instruments. Experts evaluated item clarity, relevance, construct alignment, and cultural appropriateness using structured rating forms. Item-level and scale-level Content Validity Indices (I-CVI and S-CVI/Ave) were calculated, with acceptable thresholds set at  $I-CVI \geq 0.78$  and  $S-CVI \geq 0.90$ . Qualitative feedback was used to refine item wording prior to empirical testing.

Instrument validation was conducted in a preliminary study with undergraduate students enrolled in physical education teacher education programs. A total of 212 questionnaires were distributed online, and 182 valid responses were retained after data screening. Sampling adequacy was assessed using the Kaiser–Meyer–Olkin (KMO) measure and Bartlett’s test of sphericity. Internal consistency reliability was evaluated using Cronbach’s alpha coefficients. Item-level screening was conducted using corrected item–total correlations (CITC, criterion  $\geq 0.40$ ). Items with CITC below the threshold—particularly negative CITC—were considered for removal when deletion improved scale reliability and did not change the intended construct structure.

Confirmatory factor analysis (CFA) was performed using structural equation modeling to examine the construct validity of the measurement models in the Chinese context. Model fit was evaluated using multiple indices, including  $\chi^2/df$ , comparative fit index (CFI), Tucker–Lewis’s index (TLI), incremental fit index (IFI), root mean square error of approximation (RMSEA), and root mean square residual (RMR). All analyses followed established psychometric standards.

## 3.0 RESULTS

### 3.1 Expert Content Validation

**Table 1: Item-Level Content Validity Indices (I-CVI)**

Questionnaire	Initial Items	Deleted Items	Final Items	I-CVI Range	S-CVI/Ave
Responsibility Scale in Physical Education (RSPE)	26	7	16	0.80–1.00	0.92
Perceived Locus of Causality (PLOCQ)	20	6	14	0.83–1.00	0.94
Scale for Enjoyment of Sport in Physical Education (SESPE)	20	7	13	0.86–1.00	0.95
Total	66	20	46	—	0.93

As shown in Table 1, the I-CVI values ranged from 0.80 to 1.00 for the Responsibility Scale in Physical Education (RSPE), 0.83 to 1.00 for the Perceived Locus of Causality Questionnaire (PLOCQ), and 0.86 to 1.00 for the Student Enjoyment of School Physical Education Scale (SESPE). The corresponding S-CVI/Ave values were 0.92, 0.94, and 0.95, respectively, indicating excellent content validity. Based on expert feedback and CVI criteria, 20 items showing redundancy or insufficient relevance were removed, resulting in a final pool of 46 items.

### 3.2 Preliminary Factorability and Reliability

**Table 2: KMO, Bartlett's Test, and Reliability for the Three Questionnaires (N = 182)**

Scale	Version	Items (k)	KMO	Bartlett $\chi^2$	df	p	Cronbach's $\alpha$
RSPE	Pre-screening	19	0.965	2133.681	171	< .001	0.925
RSPE	Final (after item screening)	16	0.975	2072.589	120	< .001	0.959
PLOCQ	Final	14	0.965	1472.652	91	< .001	0.941
SESPE	Final	13	0.965	1586.117	78	< .001	0.948

Note, Item screening criterion: corrected item–total correlation (CITC)  $\geq 0.40$ . RSPE removed items: F10, R15, R16 due to low/negative CITC and improved  $\alpha$  after deletion.

All three scales demonstrated excellent sampling adequacy (KMO = 0.965–0.975) and significant Bartlett's tests ( $p < .001$ ), confirming suitability for factor analysis (Table 1).

For the RSPE, the initial 19-item version ( $\alpha = .925$ ) included three items (F10, R15, R16) with CITC  $< .40$  or negative correlations. Removing this improved reliability ( $\alpha = .959$ ) and retained the conceptual integrity of the construct. The final 16-item version demonstrated excellent factorability (KMO = .975; Bartlett's  $\chi^2(120) = 2072.589$ ,  $p < .001$ ).

The PLOCQ (14 items) showed similarly strong psychometric properties (KMO = .965; Bartlett's  $\chi^2(91) = 1472.652$ ,  $p < .001$ ;  $\alpha = .941$ ). All items met the CITC threshold (0.664–0.816), and no item deletion improved reliability.

The SESPE (13 items) also showed high internal consistency ( $\alpha = .948$ ) and factorability (KMO = .965; Bartlett's  $\chi^2(78) = 1586.117$ ,  $p < .001$ ). No item removal was required.

**Table 3.13 Confirmatory Factor Analysis (CFA) Model Fit Indices (N = 182)**

Scale	Items	$\chi^2/df$	CFI	TLI	RMSEA 90% CI
RSPE	16	0.951	1.000	1.003	[.000, .036]
PLOCQ	14	1.017	.999	.999	[.000, .045]
SESPE	13	1.184	.993	.991	[.000, .058]

CFA supported the hypothesised one-factor structures for all instruments, with all models exhibiting excellent fit indices (Table 2).

RSPE (16 items):  $\chi^2(90) = 85.598$ ,  $p = .612$ ,  $\chi^2/df = 0.951$ , CFI = 1.000, TLI = 1.003, RMSEA = .000 (90% CI [.000, .036], PCLOSE = .997).

PLOCQ (14 items):  $\chi^2(67) = 68.108$ ,  $p = .439$ ,  $\chi^2/df = 1.017$ , CFI = .999, TLI = .999, RMSEA = .010 (90% CI [.000, .045], PCLOSE = .976).

SESPE (13 items):  $\chi^2(59) = 69.882$ ,  $p = .157$ ,  $\chi^2/df = 1.184$ , CFI = .993, TLI = .991, RMSEA = .032 (90% CI [.000, .058], PCLOSE = .857).

## 4.0 DISCUSSION

### 4.1 Summary of Findings

The present study translated, culturally adapted, and validated the RSPE, PLOCQ, and SESPE for use among Chinese undergraduate physical education (PE) students. The results indicate that the adapted instruments demonstrate satisfactory psychometric properties and are appropriate for assessing responsibility, motivational regulation, and enjoyment in Chinese PE learning contexts (Vasconcellos et al., 2020).

Reliability analyses showed high internal consistency across the scales, and confirmatory factor analysis further supported the adequacy of the measurement model. Taken together, these findings provide strong empirical evidence for the structural validity and reliability of the adapted instruments (Ntoumanis et al., 2021).

#### **4.2 Theoretical Implications**

From a theoretical perspective, the findings provide empirical support for the applicability of key psychological constructs—responsibility, motivational regulation, and enjoyment—within a Chinese physical education context when systematic cultural adaptation and validation procedures are applied. Although these constructs have been primarily developed and validated in Western educational settings, the present results suggest that their underlying conceptual structures remain coherent across cultural contexts (Barbosa Cano & Gomez-Baya, 2025).

The stability of the factor structures across exploratory and confirmatory analyses lends support to the broader applicability of Self-Determination Theory and responsibility-based pedagogical frameworks in physical education research beyond their original contexts (Soos et al., 2025; Vasconcellos et al., 2020). Importantly, the findings indicate that cultural differences do not fundamentally undermine these theoretical frameworks, provided that appropriate empirical validation is conducted.

In addition, the item refinement process enhanced construct clarity and dimensional coherence, highlighting the importance of empirical testing rather than direct linguistic translation when adapting measurement instruments for non-Western educational environments (Soos et al., 2025; Vasconcellos et al., 2020). By providing validated and theoretically grounded instruments, this study contributes to the growing body of cross-cultural measurement research in physical education and educational psychology.

#### **4.3 Practical Implications**

From a research perspective, the validated instruments offer reliable measures for examining motivational processes, responsibility development, and affective experiences in PE. They can be applied in future cross-sectional and intervention studies, as well as in comparative research across cultural contexts.

For PE teachers, these scales provide practical tools to assess student engagement, identify motivational challenges, and evaluate the effectiveness of instructional strategies aimed at enhancing enjoyment and responsibility. At a broader level, the findings may inform curriculum development and policy initiatives that emphasize students' psychological well-being and holistic development in physical education.

In this sense, the validated instruments not only serve academic research purposes but also provide practically meaningful tools for evaluating psychological outcomes in physical education, which is consistent with the applied orientation of education, psychology, and counseling research.

#### **4.4 Strengths of the Study**

A key strength of this study lies in its systematic and rigorous instrument validation design. The validation process integrated standardized translation procedures, expert content validation, reliability analysis, and confirmatory factor analysis, providing multiple sources of evidence for the psychometric soundness of the adapted instruments. The use of quantitative content validity indices and large-sample confirmatory analysis enhances confidence in the robustness and internal consistency of the findings.

In addition, the study applied established psychometric criteria to evaluate model fit and construct validity, ensuring methodological transparency and analytical rigor. This structured validation approach strengthens the credibility and replicability of the adapted RSPE, PLOCQ, and SESPE for use in the Chinese undergraduate physical education context.

#### **4.5 Limitations and Future Directions**

Several limitations should be acknowledged. First, the sample consisted exclusively of undergraduate physical education majors. Although this population is appropriate for preliminary instrument validation, future research should extend validation efforts to non-PE students and more diverse educational populations to improve generalizability.

Second, the cross-sectional design limits conclusions regarding the temporal stability of the instruments. Longitudinal studies are recommended to examine test–retest reliability and the stability of the factor structure over time.

Third, measurement invariance was not examined in the present study. Future research should test invariance across key demographic and contextual variables, such as gender, academic year, institutional type, and geographic region, to ensure that the instruments function equivalently across subgroups.

Finally, the current validation focused primarily on internal structure and reliability. Future studies should incorporate external validity evidence by examining associations between scale scores and relevant behavioral, academic, or instructional outcomes to further strengthen the applied value of the instruments.

#### **5.0 CONCLUSION**

This study translated, culturally adapted, and psychometrically validated the Chinese versions of the Responsibility Scale in Physical Education (RSPE), the Perceived Locus of Causality Questionnaire (PLOCQ), and the Student Enjoyment of School Physical Education Scale (SESPE) among undergraduate physical education students. The results demonstrated strong internal consistency and satisfactory model fit in confirmatory factor analysis, supporting the factorial validity of the adapted instruments.

The validated instruments provide reliable and culturally appropriate tools for assessing responsibility, motivational regulation, and enjoyment in Chinese physical education contexts. They offer a sound methodological foundation for future research in physical education and educational psychology and support systematic evaluation of students' psychological experiences in instructional settings.

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### 5.2 Ethical Statement

This study was conducted in accordance with the ethical standards of Universiti Pendidikan Sultan Idris and was approved by the Institutional Review Board (Approval No. 2025-0799-01).

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### Appendix A Responsibility Scale in Physical Education (RSPE)

- E1我在体育课上会专心学习。
- E3我认真完成每一次练习。
- E4我积极参与课堂中的各种活动。
- S5我会为自己设定学习目标。
- S6我会不断努力提升自己。
- S7我会主动激励自己进步。
- S8我愿意挑战更高难度的项目。
- F11我遵守老师制定的课堂规则。
- F13我会正确、安全地使用体育器材。
- R14同学有错误时，我不会嘲笑他们。（同学有错误时，我会嘲笑他们）
- H18我会鼓励同学积极学习。
- H19我会在技术上帮助和指导同学。
- H20我会留意并保护同学的安全。
- C23我与同学们相处融洽。
- C25我能在团队中很好地完成自己的角色。
- C26我积极配合同学，完成团队任务。

Note. (a) items E1, E3, E4 represent “effort”; (b) items S5, S6, S7, S8 represent “self-direction”; (c) items F11, F13 represent “following class rules”; (d) items R14 represent “respect for others”; (e) items H18, H19, H20 represent “helping others”; (f) items C23, C25, C26 represent “cooperation”.

### Appendix B Perceived Locus of Causality Questionnaire (PLOCQ)

- A1但我真的不知道自己为什么要参加体育课。
- A2但我不明白为什么我们必须上体育课。
- E5因为我不参加体育课，可能会惹麻烦。
- E6因为这是我必须完成的任务。
- E8因为这是学校的规定。

- I9因为我希望老师觉得我是个好学生。
- I11如果不做，我会对自己失望。
- I12不参加体育课让我感到不安。
- ID13因为我想学习运动技能。
- ID14因为我认体育课对我来说很重要。
- ID15因为我希望在体育方面有所进步。
- IM17因为我觉得体育课很有趣。
- IM18因为我喜欢掌握新的技能。
- IM19因为体育课让我感到刺激和兴奋。
- IM20因为学习新技能的过程让我很开心。

Note. (a) items A1, A2 represent “amotivation”; (b) items E5, E6, E8 represent “external regulation”; (c) items I9, I11, I12 represent “introjected regulation”; (d) items ID13, ID14, ID15 represent “identified regulation”; (e) item IM17, IM18, IM19, IM20 represent “intrinsic motivation”.

### Appendix C. Student Enjoyment of School Physical Education Scale (SESPE)

- AI1体育课上我很少学到新的动作或技能
- AI2当我觉得自己完成得很好、有能力的时候。
- AI3体育课内容重复，几乎没有什么新挑战
- AI4当我全力以赴、尽了自己最大努力时。
- AE5我的努力和表现经常被忽视或不被看见
- AE6当我在竞赛或游戏中获胜时。
- AE8能与同学进行竞技对抗。
- NI10体育课并不能缓解我的压力，反而让我更疲惫
- NI11参与自己最喜欢的体育活动。
- NI13当我觉得活动对我个人有意义的时候。
- NE15能和朋友们一起参与体育活动。
- NE19上完体育课后，我并没有感觉放松或轻松
- NE20当老师自己也很投入、玩得很开心时。

Note. (a) items AI1, AI2, AI3, AI4 represent “achievement-intrinsic”; (b) items AE5, AE6, AE8 represent “achievement-extrinsic”; (c) items NI10, NI11, NI13 represent “nonachievement-intrinsic”; (d) items NE15, NE19, NE20 represent “nonachievement-extrinsic”.