

Development and validation of the Japanese version of the Sport Engagement Scale

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Abstract

The purpose of this study was to develop a Japanese version of the Sport Engagement Scale (SES-J), evaluate its reliability and validity among Japanese competitive athletes, and examine its associations with athlete characteristics. Traditionally, research in sport psychology has focused primarily on negative psychological constructs; however, increasing attention has recently been directed toward assessing positive psychological involvement in sport. Within this context, engagement—originally conceptualized in industrial and organizational psychology—has gained prominence as a positive psychological state characterized by vigor, dedication, and absorption, and its application to the sport domain has expanded in recent years. Despite this progress, no validated Japanese version of the scale has existed, resulting in a lack of measurement infrastructure necessary for domestic research, international comparison, and the development of practical interventions. In this study, we developed the SES-J and evaluated its psychometric properties using data from 291 Japanese competitive athletes. The results supported the original three-factor structure (vigor, dedication, and absorption), and model fit indices indicated an acceptable level of fit. The SES-J demonstrated satisfactory internal consistency ($\alpha = .802-.923$) and a moderate negative correlation with the Japanese version of the Athlete Burnout Questionnaire (ABQ-J; $r = -.496, p < .001$). No significant associations were found between SES-J scores and age, years of competitive experience, or weekly training hours, and no significant differences were observed based on sex or sport type. However, comparisons across competitive levels showed that both the SES-J total score and the vigor subscale were significantly higher among athletes competing at the regional level than among those at the prefectural level, the lowest competition tier in the sample. Beyond this point, SES-J scores did not show a further increase at higher competitive levels.

Key Words: positive psychology, psychometric properties, confirmatory factor analysis, competitive athletes

Introduction

Maintaining psychological health is essential for athletes to sustain high performance in competitive environments (Reardon et al., 2019). Traditionally, many studies in sport psychology have focused on identifying and improving negative psychological states (Lonsdale et al., 2007). Specifically, measurement scales have been developed to assess psychological risk factors such as burnout (Raedeke & Smith, 2001), sport-specific trait anxiety (Smith et al., 1990), depression (Baron et al., 2013), and psychological stress (Rice et al., 2019). In addition, numerous intervention studies have been conducted with the aim of preventing or reducing these negative psychological states (Wilczyńska et al., 2022; Myall et al., 2023).

However, recovering from negative psychological states does not necessarily indicate that an athlete is positively engaged in their sport. In other words, the absence of symptoms and the state in which an athlete actively engages in sport with a sense of value, joy, and absorption are conceptually distinct, and the latter cannot be fully captured within traditional frameworks. In response to this concern, research in sport psychology has increasingly shifted toward examining not only the reduction of psychological risks and deficits but also the positive, proactive mechanisms by which athletes engage in their sport and maintain fulfilling psychological experiences (e.g., Lundqvist, 2011; Mosewich et al., 2013; Brown et al., 2018).

Within this growing shift, engagement has received increasing attention as a comprehensive indicator of athletes' positive and fulfilling psychological experiences in sport. Engagement was originally proposed by Schaufeli et al. (2002) as work engagement and has been developed as a key construct in industrial and organizational psychology. It is defined as "a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption." In this framework, vigor refers to high levels of energy and mental resilience while working, accompanied by a willingness to invest effort and to persist even in the face of

difficulties. Dedication is characterized by a strong involvement in one's work and a sense of significance and pride. Absorption refers to being fully concentrated and deeply engrossed in one's work, such that time passes quickly and it becomes difficult to detach oneself from work, often with a sense of enjoyment.

The concept of engagement can be characterized by two major features. First, engagement has been established as a comprehensive construct that assesses the extent to which individuals are positively and proactively involved in their work. Prior to the development of this construct, positive psychological involvement in work had been examined independently through several theoretical lenses, such as psychological presence (Kahn, 1992), job involvement (Lawler & Hall, 1970), and flow as an optimal experience (Csikszentmihalyi, 1990). However, these frameworks addressed only specific and fragmented aspects of positive work-related experience and did not function as an integrated measurement construct. In contrast, Schaufeli et al. (2002), drawing on the movement of positive psychology (Seligman & Csikszentmihalyi, 2000), proposed engagement as an independent psychological construct defined by the three core dimensions of vigor, dedication, and absorption, and demonstrated empirical support for its three-factor structure.

Second, engagement has been conceptualized as a positive psychological state that is not simply defined as the opposite of burnout. Traditional burnout research has been based on a deficit model (Maslach & Leiter, 1997), with its primary focus on preventing problems. However, a state in which burnout is absent does not necessarily indicate a desirable psychological condition accompanied by intrinsic motivation or concentration. In other words, the perspective of burnout research alone is insufficient to explain how individuals can continue working healthily and maintain high performance. In response to these issues, Schaufeli and Bakker (2004) demonstrated, through model-based analyses, that engagement is not simply the inverse of burnout but a conceptually distinct construct. At the same time, burnout and engagement were shown to be moderately and negatively associated at the group level.

Such conceptual issues are not limited to the occupational domain but are also present in the sport domain. In sport psychology, athletes' positive psychological functioning has been examined drawing on several theoretical frameworks (e.g., self-determination theory, flow, and subjective vitality; Deci & Ryan, 2000; Csikszentmihalyi, 1990; Ryan & Frederick, 1997). However, these approaches have tended to focus on specific psychological aspects and have not provided an integrated framework capturing positive engagement in sport. Moreover, although research on athlete burnout has advanced (Raedeke & Smith, 2001), its conceptual counterpart—reflecting a psychological state in which athletes autonomously engage in sport and continue participation with value, meaning, and enjoyment—had not been sufficiently conceptualized or measured.

In response to these conceptual limitations, Guillén and Martínez-Alvarado (2014) applied the engagement construct to the sport context. In their study, the Utrecht Work Engagement Scale (UWES; Schaufeli et al., 2002), which has served as a foundational measure for engagement research in industrial and organizational psychology, was adapted for sport, and psychometric validation was conducted with 240 Spanish soccer players. The results confirmed a three-factor structure consisting of vigor, dedication, and absorption, consistent with the UWES framework. In addition, engagement scores showed significant negative associations with sport-related burnout. Following this initial study, further work has been conducted internationally, including the development of the Polish version of the scale (Stolarski et al., 2022).

Furthermore, applied research using the Sport Engagement Scale has gradually expanded. Sport engagement has been associated with objective performance indicators (Pruszcak & Stolarski, 2025). At the level of individual differences, it has been linked to temporal characteristics, specifically future time perspective (Stolarski et al., 2026), as well as to dimensions of perfectionism (Waleriańczyk et al., 2022). In addition, sport engagement has been positively associated with life satisfaction and psychological well-being (Özsarı et al., 2026). Collectively, these findings indicate that sport engagement represents an important construct associated with both performance outcomes and psychological well-being across international contexts. However, despite this growing body of evidence, a validated Japanese version of the scale has not yet been developed. Consequently, the measurement foundation required for comparative and intervention research with Japanese athletes remains insufficient.

Therefore, this study aimed to develop a Japanese version of the Sport Engagement Scale and examine its reliability and validity among Japanese athletes, while also examining potential associations with athlete characteristics such as sex and competitive level. Specifically, we examined whether the original three-factor structure could be replicated in a Japanese athletic sample and evaluated reliability and validity through associations with related psychological measures. In addition, exploratory analyses were conducted to investigate score differences across demographic and sport-related variables, with the goal of contributing to the foundation of engagement research in the Japanese sport context.

Methods

Translation Process

To develop the Japanese version of the scale, permission to translate the original instrument was first obtained from its authors. Two researchers specializing in sport psychology then independently translated the original scale into Japanese. Differences in wording and conceptual interpretation were reviewed, and a single reconciled version was produced. Next, a professional bilingual translator conducted a back-translation, which

was subsequently sent to the original authors for review. Approval was obtained, confirming that there were no semantic or conceptual inconsistencies between the original and translated versions.

A small pilot test was then conducted with athletes ($n = 5$) to examine whether any item wording was difficult to understand. Participants were asked to provide brief comments on the clarity and naturalness of each item. No major misunderstandings or issues were reported, confirming that the translated version was adequately comprehensible. Accordingly, the translated version was finalized and used in the present study.

Participants and Procedure

The participants consisted of 291 Japanese competitive athletes (Table 1: 210 males and 81 females; mean age = 20.87 years, $SD = 3.95$). The inclusion criteria were: (1) currently participating in sport and competing in at least one tournament per year, and (2) being 18 years of age or older. The athletes represented a wide variety of sports, including tennis, track and field, soccer, basketball, and swimming, totaling 44 disciplines. The mean duration of competitive experience was 10.14 years ($SD = 5.95$), and the average weekly training time was 15.92 hours ($SD = 8.93$).

The competitive achievement levels of the participants varied, ranging from athletes with experience in international tournaments to those competing at the prefectural level. In Japan, competitive sports generally adopt a hierarchical tournament system in which athletes progress stepwise from local competitions to the international stage. In many sports, athletes first compete at the prefectural level, and those who place high enough to qualify advance to the regional competition. Only athletes who successfully advance at the regional level are eligible to participate in the national competition, and those who achieve outstanding results at the national level may ultimately compete in international tournaments as representatives of Japan.

Participants selected one of six categories to indicate their highest competitive level: prefectural competitor, regional competitor, national competitor, national medalist, international competitor, and international medalist. Because the upper three categories were sparsely represented, national medalist, international competitor, and international medalist were combined into a single group labeled top national/international level. As a result, participants were classified into four groups: (1) prefectural level ($n = 74$), (2) regional level ($n = 74$), (3) national level ($n = 75$), and (4) top national/international level ($n = 68$).

This study was conducted with the approval of the Keio University School of Medicine Ethics Committee (Approval ID: 20241198). The survey was administered between July and October 2025, and responses were collected using an online form. The survey platform included multiple security measures, such as SSL/TLS encryption, server certification, and firewall-based access control. Prior to participation, all respondents were informed about the study purpose, procedures, and ethical considerations, and informed consent was obtained. All respondents completed every item, and no missing or invalid responses were identified; therefore, all 291 participants were included in the analyses.

Table 1. Participant Characteristics

Variable	Category	n	%
Sex	Male	210	72.2
	Female	81	27.8
Age	18-20 years	160	55.0
	21-25 years	120	41.2
	26+ years	11	3.8
Sport Type	Individual	152	52.2
	Team	139	47.8
Years of Experience	0-5 years	55	18.9
	5-10 years	65	22.3
	10-15 years	118	40.5
	15+ years	53	18.2
Weekly Training Hours	0-5 hours	28	9.6
	5-10 hours	51	17.5
	10-15 hours	47	16.1
	15-20 hours	54	18.6
	20-25 hours	61	21.0
	25+ hours	50	17.2
Highest Competitive Achievement	International medalist	10	3.4
	International competitor	9	3.1
	National medalist	49	16.8
	National competitor	75	25.8
	Regional competitor	74	25.4
	Prefectural competitor	74	25.4

*Measures**Demographic information*

Participants reported their sex, age, primary sport, years of competitive experience, weekly training hours, and highest competitive achievement.

Japanese version of the Sport Engagement Scale (SES-J)

The Japanese version of the Sport Engagement Scale (SES; Guillén & Martínez-Alvarado, 2014), developed following the translation procedures described above, was used. The scale consists of 15 items across three subscales (five items each): vigor, dedication, and absorption. Example items include “I feel full of energy during my training and matches” (vigor), “I am enthusiastic about my sport activity” (dedication), and “Time flies when I am training or competing” (absorption). All items were rated on a 7-point Likert scale (1 = Not at all, 7 = Always).

Japanese version of the Athlete Burnout Questionnaire (ABQ-J)

To examine the criterion-related validity of the SES-J, the relationship between sport engagement and burnout was examined, following the original validation study of the SES (Guillén & Martínez-Alvarado, 2014) and its Polish adaptation (Stolarski et al., 2022). In the present study, burnout was assessed using the Japanese version of the Athlete Burnout Questionnaire (ABQ; Raedeke & Smith, 2001), developed by Kamimura et al. (2020).

The scale consists of 15 items across three subscales (five items each): emotional/physical exhaustion, devaluation, and reduced sense of accomplishment. Example items include “I am so tired from practice that I don’t feel like doing other things” (emotional/physical exhaustion), “I’m not as concerned about my performance as I used to be” (devaluation), and “It seems that no matter what I do, I can’t perform as well as I should” (reduced sense of accomplishment). All items were rated on a 5-point Likert scale (1 = Almost never, 5 = Almost always).

Data Analysis

Statistical analyses were conducted using IBM SPSS Statistics (Version 30), IBM SPSS AMOS (Version 30), and R (Version 4.4.3). First, descriptive statistics (mean, standard deviation, skewness, and kurtosis) were calculated for all 15 SES-J items to examine distributional characteristics.

Next, construct validity was evaluated using confirmatory factor analysis (CFA) with maximum likelihood estimation, assuming the original three-factor structure (vigor, dedication, and absorption). Model fit was evaluated using χ^2/df , Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA). Following conventional criteria, values of CFI and TLI $\geq .90$ (preferably $\geq .95$) and RMSEA $\leq .08$ were considered indicative of acceptable model fit. Additionally, the Akaike Information Criterion (AIC) and Expected Cross-Validation Index (ECVI) were referenced for model comparison.

To assess internal consistency, Cronbach’s α and McDonald’s ω coefficients were calculated for each subscale as well as for the total scale. To further examine structural characteristics of the subscale score profiles, a repeated-measures analysis of variance (ANOVA) was conducted with the three SES-J subscales as within-subject factors, followed by Bonferroni-adjusted pairwise comparisons.

Criterion-related validity was then examined by analyzing the association between the SES-J and the ABQ-J. Pearson’s correlation coefficients were computed between SES-J scores (total and subscale scores) and ABQ-J scores (total score and subscale scores). Based on theoretical assumptions that sport engagement is negatively associated with burnout, negative correlations were expected and interpreted as evidence supporting criterion-related validity.

To examine the associations between SES-J scores and participant characteristics, Pearson’s correlation coefficients were calculated for age, years of competitive experience, and weekly training hours as continuous variables. In addition, a one-way analysis of variance (ANOVA) was conducted to compare SES-J scores across sex, sport type (individual vs. team), and competitive-level groups (prefectural, regional, national, and top national/international levels). When the assumption of homogeneity of variance was met, Tukey’s HSD post-hoc tests were performed for multiple comparisons. The significance level for all statistical analyses was set at $p < .05$ (two-tailed).

Results*Descriptive Statistics*

Descriptive statistics were calculated for all 15 SES-J items (Table 2). Item means ranged from 3.93 (Item 13) to 6.22 (Item 3), and standard deviations ranged from 1.11 to 1.72. Skewness values ranged from -1.88 to 0.00 , and kurtosis values ranged from -0.91 to 4.32 . For all items, both skewness and kurtosis met the recommended criteria for applying maximum likelihood (ML) estimation, as proposed by West et al. (1995), namely $|\text{skewness}| < 2$ and $|\text{kurtosis}| < 7$. Based on these results, the distributional characteristics of the data were considered acceptable for conducting confirmatory factor analysis (CFA) and correlation analyses using ML estimation.

Table 2. Descriptive Statistics for SES-J Items

No.	Item	M	SD	Skewness	Kurtosis
1	I am able to train for long periods of time. (Vigor 1) 長時間、練習やトレーニングをすることができる。	5.04	1.34	-0.44	-0.25
2	I am very persistent in my sport activity. (Vigor 2) 難しい状況でも、スポーツ活動にとっても粘り強く取り組む。	5.62	1.28	-1.05	0.95
3	My sport activity is a self-challenge. (Dedication 1) スポーツ活動は、より良い自分になるための挑戦だ。	6.22	1.12	-1.88	4.32
4	I am enthusiastic about my sport activity. (Dedication 2) スポーツ活動に熱心である。	6.07	1.14	-1.54	3.20
5	I am proud of the work I do. (Dedication 3) 自分のスポーツでの取り組みに誇りを持っている。	5.89	1.30	-1.34	1.73
6	I feel full of energy during my training and matches. (Vigor 3) トレーニング中、そして試合中も元気いっぱいだ。	4.95	1.40	-0.41	-0.46
7	When I get up in the morning, I look forward to training. (Vigor 4) 朝起きると、練習やトレーニングが楽しみだ。	4.14	1.56	-0.18	-0.65
8	I am strong and vigorous in my sport activity. (Vigor 5) 心身ともにタフで、精力的にスポーツ活動に取り組んでいる。	5.18	1.38	-0.63	0.30
9	My sport activity is full of meaning and resolve. (Dedication 4) 自分のスポーツ活動は、意義と覚悟に満ちている。	5.32	1.42	-0.68	0.03
10	I feel inspired whilst carrying out my sport activity. (Absorption 1) スポーツ活動に、つい夢中になってしまう。	5.52	1.40	-0.94	0.61
11	I am happy when I am engrossed in my sport activity. (Absorption 2) スポーツ活動に夢中になっているとき、幸せだと感じる。	5.89	1.28	-1.22	1.38
12	I am carried away by my sport activity. (Dedication 5) スポーツ活動をしていると、心が動かされる。	5.95	1.11	-1.13	1.37
13	I am oblivious to everything around me when training. (Absorption 3) 練習やトレーニングをしていると、自分の周囲で起こっていることはすべて忘れてしまう。	3.93	1.72	0.00	-0.91
14	I am absorbed in my sport activity. (Absorption 4) スポーツ活動に、のめり込んでいる。	5.30	1.51	-0.78	0.16
15	Time flies when I am training or competing. (Absorption 5) 練習やトレーニング、試合をしていると、あっという間に時間が過ぎる。	5.49	1.43	-0.88	0.38

Confirmatory Factor Analysis

To examine the construct validity of the Japanese version of the SES-J, a confirmatory factor analysis (CFA) was conducted based on the original three-factor structure of the SES (Guillén & Martínez-Alvarado, 2014), consisting of vigor, dedication, and absorption. CFA was performed using AMOS (Version 30) with maximum likelihood (ML) estimation.

First, the model fit of the three-factor model (Model 1), consisting of the same 15 items as the original scale, was examined. Model 1 demonstrated a marginally acceptable fit: $\chi^2(87)=293.35$, $\chi^2/df=3.37$, CFI=.904, TLI=.884, RMSEA=.090 (90% CI [.079-.102]) (Table 3). Although the CFI exceeded the recommended criterion of .90, the TLI and RMSEA did not fully meet the expected thresholds, and therefore the overall model fit was judged to be moderate. In addition, an examination of the standardized factor loadings revealed that the loading for the absorption item (Item 13) was relatively low at .388, suggesting limited adequacy of this item as an indicator of its intended latent construct.

To improve the item-level structural validity, Item 13 was removed due to its relatively low standardized factor loading (.388), and a revised three-factor model consisting of 14 items (Model 2) was tested. The model fit indices for Model 2 were $\chi^2(74)=265.26$, $\chi^2/df=3.59$, CFI=.909, TLI=.888, and RMSEA=.094 (90% CI [.082-.107]). Compared to Model 1, the CFI and TLI showed a slight improvement, and the AIC decreased to 355.26. However, RMSEA remained in the .09 range and did not show a marked improvement. The standardized factor loadings ranged from .568 to .778 for vigor, .603 to .786 for dedication, and .655 to .848 for absorption, indicating that the removal of Item 13 allowed each item to more clearly reflect its corresponding latent factor.

Next, modification indices (MIs) were examined for Model 2. Several relatively high MIs were observed among error covariances between item pairs belonging to the same factor: Items 2 and 7 within the vigor factor (e2-e7), Items 5 and 9 within the dedication factor (e5-e9), and Items 11 and 14 within the absorption factor (e11-e14). These patterns can be interpreted as potential local dependence, likely attributable to similarities in item content.

Therefore, a modified model (Model 3) was tested, in which error covariances were freed only for these three theoretically interpretable item pairs. The results indicated improved model fit: $\chi^2(71)=205.01$, $\chi^2/df=2.89$, CFI=.936, TLI=.918, RMSEA=.081 (90% CI [.068-.094]), AIC=301.01, and ECVI=1.038. Compared with Model 1 and Model 2, Model 3 demonstrated consistent improvement across indices such as CFI, TLI, AIC, and ECVI, and was therefore evaluated as the best-fitting three-factor model tested. Standardized factor loadings ranged from .563-.769 for vigor, .605-.785 for dedication, and .655-.842 for absorption, confirming that all items adequately reflected their intended latent constructs.

Correlations among the three latent factors were high: $r=.88$ between vigor and dedication, $r=.92$ between dedication and absorption, and $r=.82$ between vigor and absorption. Therefore, as an exploratory comparison, a one-factor model assuming that all 14 items measure a single engagement construct (Model 4) was also tested. The resulting model fit indices were $\chi^2(77)=321.30$, $\chi^2/df=4.17$, CFI=.883, TLI=.862, and RMSEA=.105 (90% CI [.093-.117]), all of which showed poorer model fit relative to the three-factor models. In particular, the CFI fell below .90, and RMSEA exceeded .10, indicating that a unidimensional model was not appropriate for the SES-J.

Based on these findings, Model 3 was retained as the final SES-J factor structure, as it demonstrated the best overall fit compared with Models 1, 2, and the unidimensional Model 4. Specifically, the three-factor models consistently showed superior fit compared with the one-factor model, indicating that engagement is better represented as a multidimensional construct rather than a unidimensional one. Among the three-factor solutions, Model 3 provided the most adequate balance between model fit and theoretical interpretability. This final model consists of 14 items with a three-factor structure (vigor, dedication, absorption) and includes theoretically justified correlated error terms.

Table 3. Comparison of Confirmatory Factor Analysis Models for the SES-J

Model	χ^2	df	χ^2/df	CFI	TLI	RMSEA (90% CI)	AIC	ECVI
Model 1: 3-factor, 15 items	293.35	87	3.37	0.904	0.884	.090 [.079-.102]	389.35	1.343
Model 2: 3-factor, 14 items	265.26	74	3.59	0.909	0.888	.094 [.082-.107]	355.26	1.225
Model 3: 3-factor, 14 items after MI	205.01	71	2.89	0.936	0.918	.081 [.068-.094]	301.01	1.038
Model 4: 1-factor, 14 items	321.30	77	4.17	0.883	0.862	.105 [.093-.117]	405.30	1.398

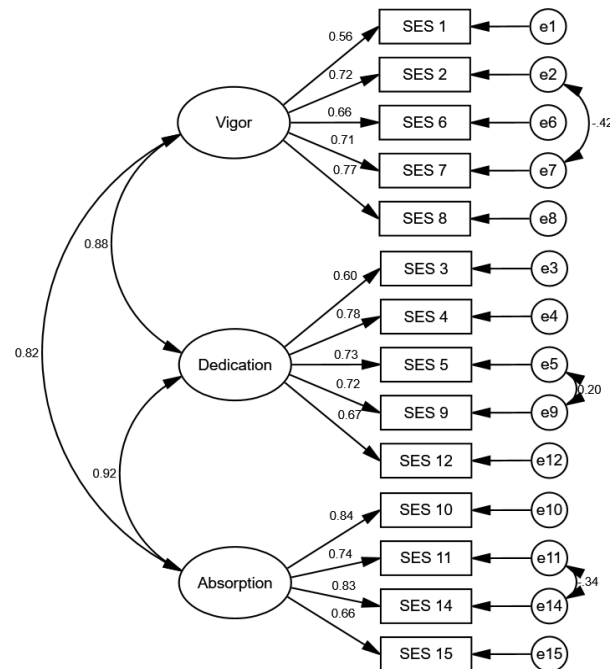


Figure 1. Confirmatory factor analysis results for Model 3 of the SES-J

Reliability

To examine the internal consistency of the SES-J, Cronbach's α and McDonald's ω were calculated for each subscale and the total scale. The results indicated good reliability for all three factors: vigor ($\alpha = .802$, $\omega = .850$), dedication ($\alpha = .834$, $\omega = .852$), and absorption ($\alpha = .836$, $\omega = .880$). The total scale, consisting of 14 items, also demonstrated high internal consistency ($\alpha = .923$, $\omega = .933$).

Subscale Score Structure

To examine mean-level differences among the three engagement dimensions, a repeated-measures ANOVA was conducted using vigor, dedication, and absorption as within-subject variables. Results indicated a significant main effect of subscale, $F(2, 580) = 206.24$, $p < .001$, $\eta^2 = .416$, demonstrating that the three dimensions differ in magnitude at the score level. Post-hoc Bonferroni comparisons showed that dedication was significantly higher than both vigor ($p < .001$) and absorption ($p < .001$), and vigor was significantly higher than absorption ($p < .001$).

Criterion-related Validity

First, the internal consistency of the Japanese ABQ-J was examined. The emotional/physical exhaustion factor demonstrated very high reliability (Cronbach's $\alpha = .910$, McDonald's $\omega = .911$). The devaluation factor also showed good internal consistency ($\alpha = .772$, $\omega = .775$), indicating sufficient stability as a subscale. In contrast, the reduced sense of accomplishment factor showed lower internal consistency ($\alpha = .630$, $\omega = .651$). This tendency for lower α values in the reduced sense of accomplishment factor has been consistently reported in previous studies (Arce et al., 2012; Kamimura et al., 2020), and the value obtained in this study aligns with that

pattern. Given that the total score demonstrated high reliability ($\alpha = .846$, $\omega = .889$), the ABQ-J was considered appropriate for use as a criterion measure in this study.

Next, criterion-related validity of the SES-J was examined by calculating Pearson's correlation coefficients between SES-J scores (total and subscales) and ABQ-J scores (total and subscales; Table 4). The SES-J total score showed a moderate negative correlation with the ABQ-J total score ($r = -.496$, $p < .001$), indicating that athletes with higher sport engagement tended to report lower levels of burnout. All SES-J subscales—vigor, dedication, and absorption—were significantly and negatively correlated with each ABQ-J factor, with coefficients ranging from $-.141$ to $-.562$. The strongest associations were observed between SES-J scores and the reduced sense of accomplishment factor, particularly for the SES-J total score ($r = -.562$, $p < .001$) and dedication ($r = -.561$, $p < .001$), followed by absorption ($r = -.515$, $p < .001$) and vigor ($r = -.463$, $p < .001$).

Table 4. Correlations Between the SES-J and the ABQ-J

Variable	M	SD	α	1	2	3	4	5	6	7	8
1. SES Total	5.47	0.95	0.923	—	.904**	.913**	.911**	-.496**	-.562**	-.236**	-.460**
2. Vigor	4.99	1.04	0.802	—	—	.723**	.724**	-.460**	-.463**	-.287**	-.379**
3. Dedication	5.89	0.95	0.834	—	—	—	.778**	-.441**	-.561**	-.141*	-.437**
4. Absorption	5.55	1.15	0.836	—	—	—	—	-.451**	-.515**	-.208**	-.444**
5. ABQ Total	2.39	0.62	0.846	—	—	—	—	—	.811**	.783**	.804**
6. Reduced sense of accomplishment	2.41	0.73	0.630	—	—	—	—	—	—	.399**	.741**
7. Exhaustion	2.65	0.97	0.910	—	—	—	—	—	—	—	.376**
8. Devaluation	2.26	0.83	0.772	—	—	—	—	—	—	—	—

** $p < .01$.

Analysis by Athlete Characteristics

First, Pearson's correlation coefficients were calculated to examine the associations between SES-J scores and individual characteristics (age, years of competitive experience, and weekly training hours). The results showed no significant correlations between the SES-J total score and any of the continuous variables (age: $r = .031$, $p = .600$; years of competitive experience: $r = .028$, $p = .632$; weekly training hours: $r = .083$, $p = .159$). Similarly, no significant correlations were observed for any of the subscales, with all coefficients remaining below $r < .11$ (all $p > .05$).

Next, one-way analyses of variance (ANOVA) were conducted to examine whether SES-J scores differed across categorical variables, including sex, sport type (individual vs. team), and competitive level (prefectural, regional, national, and top national/international).

The comparison by sex revealed no significant differences in the SES-J total score ($F(1, 289) = 1.337$, $p = .249$) or in any of the subscales (vigor: $p = .329$, dedication: $p = .418$, absorption: $p = .168$). Similarly, no significant differences were found between individual and team sport athletes for either the total score ($F(1, 289) = .037$, $p = .848$) or subscale scores (all $p > .40$).

In contrast, the comparison across competitive levels revealed significant main effects for the SES-J total score ($F(3, 287) = 3.046$, $p = .029$, $\eta^2 = .031$) and the vigor subscale ($F(3, 287) = 3.683$, $p = .012$, $\eta^2 = .037$) (Figure 2). Post-hoc Tukey tests indicated that athletes competing at the regional level scored significantly higher than those at the prefectural level (total score: $p = .018$; vigor: $p = .006$). However, no significant differences were observed for athletes competing at the national level or at the top national/international level when compared with the other groups (all $p > .19$). For the dedication and absorption subscales, there was a trend toward group differences based on competition level; however, neither reached statistical significance (dedication: $F(3, 287) = 2.310$, $p = .077$; absorption: $F(3, 287) = 2.221$, $p = .086$).

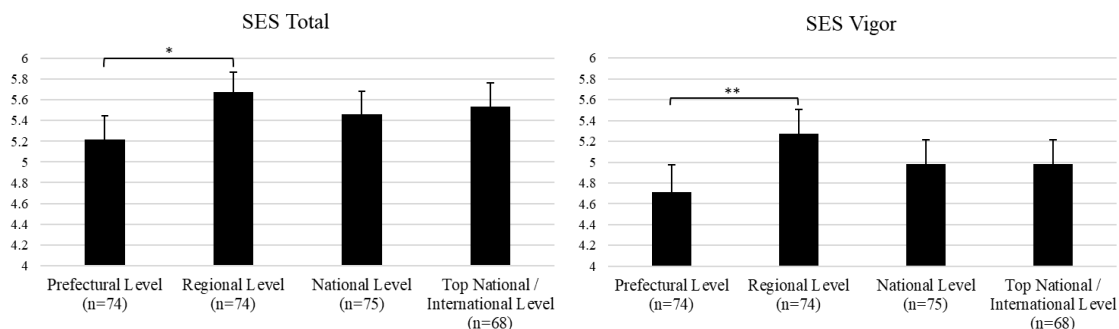


Figure 2. Mean scores of SES total and SES vigor across competition levels (* $p < .05$, ** $p < .01$)

Discussion

Support for the Three-Factor Structure

The purpose of this study was to translate the SES (Guillén & Martínez-Alvarado, 2014) into Japanese and evaluate its psychometric properties. The findings demonstrated, through confirmatory factor analysis, that the SES-J replicated the original three-factor structure consisting of vigor, dedication, and absorption. This result is consistent with both the original validation of the SES (Guillén & Martínez-Alvarado, 2014) and the Polish adaptation (Stolarski et al., 2022), which supported a three-factor structure comprising vigor, dedication, and absorption. Taken together, these findings suggest that sport engagement reflects a cross-culturally generalizable construct rather than one confined to a specific cultural context.

Psychological Interpretation of the Subscale Profile

A comparison of mean scores across the three subscales revealed that dedication scored significantly higher than both vigor and absorption. In addition, vigor and absorption demonstrated relatively greater variability. This pattern mirrors findings from the original Spanish validation (Guillén & Martínez-Alvarado, 2014) and the Polish version (Stolarski et al., 2022), suggesting that such score distribution may represent a stable and replicable characteristic of the sport engagement construct.

This distribution, marked by relatively higher dedication scores, may be explained by features of the athletes included in this study. Lamont-Mills and Christensen (2006) classified individuals into three levels of sport participation: elite, recreational, and non-participants. In line with this framework, the participants in the present study, and those in previous validation studies, largely fell within the elite category, characterized by sport involvement primarily driven by competitive goals, performance improvement, and advancement within the sporting pathway. Lamont-Mills and Christensen also reported that elite participants, compared with recreational participants, typically show higher levels of athletic identity, meaning that sport tends to become a central component of their self-concept. As a result, the sense of meaning and significance embedded in dedication may become internalized relatively early among elite participants.

In contrast, vigor and absorption appear to be more susceptible to fluctuations caused by various internal and external factors, such as physical condition, competitive outcomes, coaching environment, team climate, and past success experiences. Consequently, these components may demonstrate greater situational dependence and variability, which may explain the wider score distribution observed for vigor and absorption in this study.

Relationship Between Sport Engagement and Burnout

A moderate negative correlation was observed between the SES-J and the ABQ-J. This result is consistent with the theoretical view that engagement and burnout are conceptually distinct constructs that are nonetheless inversely related (Schaufeli & Bakker, 2004). Furthermore, similar findings have been reported in the original Spanish validation (Guillén & Martínez-Alvarado, 2014) as well as in the Polish adaptation (Stolarski et al., 2022), indicating cross-cultural replicability and supporting the construct validity of the SES-J.

Additionally, subscale-level analyses showed that the strongest negative association was observed between the SES-J and the reduced sense of accomplishment subscale of the ABQ-J. This subscale represents a tendency in which athletes perceive their performance as insufficient or feel that their efforts are not adequately reflected in their results (Raedeke & Smith, 2001; Kamimura et al., 2020). Higher scores on this factor were associated with lower levels of vigor, absorption, and dedication, suggesting that decreased perceived achievement may hinder the sustaining of engagement in sport. Thus, reduced sense of accomplishment may function not only as an early indicator of burnout but also as a psychological risk condition that contributes to decreased engagement levels.

Differences in Engagement by Competitive Level

A comparison of SES-J scores across competitive levels revealed that athletes competing at the prefectural level—the lowest competitive tier in the present sample—reported significantly lower SES-J total scores than those competing at the regional level, with a particularly pronounced difference observed in the vigor subscale. This result is notable because a preliminary analysis testing the relationship between competitive level and training volume did not show meaningful differences among groups ($F(3, 287)=3.44$, $p=.017$; post-hoc ns; $\eta^2=.035$, small effect size). In other words, despite maintaining a similar amount of weekly training as athletes in higher competitive categories, those at the prefectural level may represent a group whose training efforts do not necessarily lead to competitive success. From this perspective, it is possible that engagement scores are lower among athletes whose sustained training is not accompanied by corresponding competitive outcomes.

The competitive sport environment is typically characterized by a hierarchical developmental structure, in which a large number of athletes are located at the lower levels, and the number sharply decreases as one advances upward (Bailey & Collins, 2013). From this perspective, the prefectural-level athletes in the present study correspond to the broadest layer at the base of the structure. Therefore, progressing from the prefectural level to the regional level represents the first major selection stage for athletes, where intense competition emerges due to the limited number of qualifying spots. Consequently, moving beyond this stage may function as a mastery experience that strengthens self-efficacy (Bandura, 1997) and may be associated with higher scores on measures of sport engagement.

However, within the framework of this study, it remains unclear whether passing this stage leads to increased engagement or whether athletes with higher engagement were more capable of crossing it. Even so, the findings

suggest that athletes who have experienced surpassing this selection stage may undergo a qualitative difference in their psychological state in relation to their engagement in sport.

Moreover, unlike previous findings showing higher engagement scores at higher competitive levels (Stolarski et al., 2022), the present study indicated that engagement scores were highest at the regional level, with no further increase at higher levels. This discrepancy may be attributable to differences in sample characteristics and the categorization of competitive levels between the two studies. In the Polish validation study, athletes were classified into three broad groups—recreational ($n = 27$), amateur ($n = 110$), and semi-professional/professional ($n = 77$). In contrast, the present study further differentiated competitive levels within the amateur and semi-professional/professional range and examined engagement scores in greater detail among athletes competing at higher competitive levels.

One possible explanation for the absence of a further increase in engagement scores at higher competitive levels is that athletes competing at the national and international levels are exposed to a range of sport-specific stressors. These include excessive training load, recurrent injuries, burnout, heightened media scrutiny, and concerns regarding career termination. Previous research has shown that such stressors are associated with mental health challenges among elite athletes, including anxiety and depressive symptoms (Rice et al., 2016). The accumulation of these elite-level psychological burdens may limit further increases in engagement and instead contribute to a plateau in engagement scores among athletes competing at the highest levels.

Practical Implications for Applied Sport Contexts

Synthesizing these findings, while psychological support for top athletes facing unique performance-related stressors remains essential, the present results indicate that similar support may also be necessary for athletes who continue to invest effort without corresponding competitive advancement. Recent position statements and mental health guidelines in sport have predominantly targeted Olympic and professional-level athletes, and it has been noted that concrete frameworks for supporting developmental athletes remain insufficiently established (Vella & Swann, 2021).

Furthermore, in individual sports where coaches supervise multiple athletes simultaneously, it is plausible that available resources and psychological support are preferentially directed toward higher-performing athletes. This tendency may be partly explained by evidence indicating that coaches themselves perceive outcome-based evaluation structures—such as competitive results, contract renewal uncertainty, and organizational expectations—as major sources of stress (Norris et al., 2017).

Consequently, athletes who have not yet demonstrated clear competitive outcomes may be at risk of receiving reduced support, which could contribute to lower engagement, increased vulnerability to burnout, and, in some cases, premature sport dropout. Therefore, regardless of competitive level, building support systems that enable athletes in the developmental stage to experience meaningful progress, mastery, and success experiences represents an important direction for future sport practice and policy.

Limitations and Future Directions

This study has several limitations. First, the sample consisted primarily of Japanese competitive athletes, with the majority of participants falling within the 18-25-year age range, and did not sufficiently include a broader range of groups, such as junior and senior high school athletes, middle-aged athletes, or retired competitors. Accordingly, future research should include athletes across a wider range of developmental and career stages.

Second, this study was unable to conduct detailed analyses by sport discipline, and comparisons were limited to a binary distinction between individual and team sports. As a result, differences in engagement based on sport-specific characteristics could not be examined in detail. Future studies should aim to secure larger samples that enable sport-by-sport comparisons while considering the contextual features of each discipline.

Third, this study examined only the association with burnout, and the relationships between the SES-J and other major psychological indicators in sport remain unexplored. Future research should clarify how the SES-J relates to other psychological and behavioral constructs and where it is positioned within the broader framework of sport psychology, thereby deepening conceptual understanding and expanding its applied relevance. Finally, because the study employed a cross-sectional design, causal inferences cannot be made. Longitudinal or intervention-based research will be needed to examine temporal and developmental changes in sport engagement.

Conclusions

The purpose of this study was to translate the SES originally developed by Guillén and Martínez-Alvarado (2014) into Japanese and to evaluate its reliability and validity among Japanese competitive athletes, while also examining associations with athlete characteristics. Analyses based on data from 291 athletes demonstrated that the SES-J retained the original three-factor structure—vigor, dedication, and absorption—and showed acceptable model fit indices in the confirmatory factor analysis. Internal consistency was high for all subscales as well as for the total score, and theoretically consistent negative associations with the Japanese version of the ABQ-J were observed. Additionally, exploratory analyses indicated no significant correlations between SES-J scores and age, years of competitive experience, or weekly training hours, nor were there significant differences based on sex or sport type. However, when comparing engagement across competitive levels, a significant difference emerged specifically between the prefectural and regional groups, and this difference was most pronounced in vigor.

The contributions of this study are threefold. First, by developing and validating the SES-J, this study provides a foundational measurement tool for quantitatively assessing sport engagement within the Japanese athletic context. This enables future applications in empirical research and intervention studies. Second, the replication of the original three-factor structure, along with correlation patterns consistent with previous research on burnout, suggests that sport engagement may represent a psychologically meaningful construct that is comparable across cultures. This has important implications for future international comparative studies and meta-analyses that aim to position Japanese data within a global research framework. Third, unlike previous research suggesting that engagement scores increase with higher competitive levels, the present study did not support a linear increase in engagement across competitive levels, representing a novel contribution of this study. Notably, the finding that athletes competing at the prefectural level showed the lowest engagement scores indicates a potential need for psychological support not only for top-level athletes facing high competitive pressure, but also for athletes who continue to invest effort yet do not experience corresponding improvements in competitive level.

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Conflicts of interest

The authors declare no conflicts of interest and received no external funding for this study.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the authors used AI-assisted language tools (ChatGPT and DeepL) solely to improve grammar, spelling, and linguistic clarity. All content was carefully reviewed and edited by the authors, who take full responsibility for the final manuscript.

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