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Self-Efficacy and Time Perspective as Psychological Correlates of Physical Literacy

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Abstract

Background

Physical literacy is increasingly recognised as a multidimensional construct relevant to sustained engagement in physical activity. However, its psychological correlates remain insufficiently understood. This study examined whether general self-efficacy and time perspective are associated with individual differences in perceived physical literacy.

Methods

The sample comprised 593 participants aged 17–65 years (M = 34.10, SD = 13.22; 60.9% women). Participants completed the six-item Serbian version of the Portuguese Physical Literacy Assessment (PPLA-6), the General Self-Efficacy Scale, and the 15-item Serbian short version of the Zimbardo Time Perspective Inventory. A structural equation model was tested in R using the lavaan package and robust maximum likelihood estimation.

Results

General self-efficacy showed the strongest positive association with perceived physical literacy (β = .330), while Future Orientation (β = .202) and Present-Hedonistic Orientation (β = .207) were also significantly and positively associated with perceived physical literacy. Past-Positive, Present-Fatalistic, and Past-Negative orientations were not statistically significant. The model explained 35.8% of the variance in perceived physical literacy and demonstrated acceptable overall fit (CFI = .922, TLI = .912, RMSEA = .042, SRMR = .048).

Conclusions

Self-efficacy and selected dimensions of time perspective appear to be relevant psychological correlates of perceived physical literacy. Confidence in personal capability, future-oriented thinking, and present-focused enjoyment may contribute to understanding individual differences in perceived physical literacy. Given the cross-sectional design, longitudinal and intervention studies are needed to clarify the direction of these associations.

Background

Regular physical activity is an important determinant of physical and mental health across the lifespan. Nevertheless, sedentary lifestyles remain prevalent worldwide, contributing to adverse physical and psychological outcomes. Despite sustained public-health efforts emphasizing the benefits of exercise,

many individuals remain insufficiently active, suggesting that engagement in physical activity depends on more than knowledge of its health benefits alone.

In response to this challenge, physical literacy (PL) has emerged as a comprehensive framework for understanding lifelong engagement in physical activity. Rather than focusing exclusively on physical competence or athletic performance, physical literacy integrates motivation, confidence, physical competence, knowledge, and understanding that enable individuals to value and take responsibility for maintaining an active lifestyle throughout life [1]. Consequently, physical literacy has developed from a concept primarily associated with physical education into a broader framework relevant to public health, healthy aging, rehabilitation, and health promotion.

The rapid expansion of physical literacy research has generated substantial conceptual diversity. Definitions, operationalizations, and assessment approaches vary across countries and scientific disciplines [2, 3]. Nevertheless, there is broad agreement that physical literacy is a multidimensional and dynamic construct that develops through interactions between the individual and the environment across the lifespan [4, 5].

This multidimensional perspective has important implications. If physical literacy integrates physical, cognitive, and affective domains, it cannot be fully understood from the perspective of movement sciences alone. Psychological characteristics that influence how individuals perceive themselves, regulate behaviour, pursue goals, and respond to challenges are therefore relevant to physical literacy research. Yet psychological correlates of physical literacy remain less investigated than its educational, physiological, or motor components.

Existing research indicates that higher physical literacy is associated with greater physical activity [6]. Much of this literature, however, has focused on documenting associations rather than identifying psychological characteristics associated with individual differences in perceived physical literacy.

Among potential psychological correlates, self-efficacy appears particularly relevant. In Social Cognitive Theory, self-efficacy refers to beliefs about one's capability to organize and execute actions required to achieve desired outcomes [7–9]. Individuals with stronger self-efficacy tend to show greater persistence when facing obstacles and are more likely to engage in challenging activities. Because physical literacy includes confidence, motivation, and sustained engagement in physical activity, general self-efficacy may be closely related to perceived physical literacy.

Recent evidence supports the relevance of self-efficacy within physical-activity contexts, although findings vary according to population and outcome. Peng et al. [10] found that physical exercise was positively associated with self-efficacy in adolescents, directly and indirectly through psychological resilience. By contrast, de Oliveira Barbosa et al. [11] did not find a significant direct association between self-efficacy and physical activity in adolescents after motivational and environmental factors were considered. These findings suggest that self-efficacy is embedded in a wider motivational system and

support examining its association with physical literacy, a construct that explicitly incorporates confidence and sustained engagement.

Another construct that may contribute to understanding physical literacy is time perspective. Time perspective reflects individual differences in the extent to which people orient thoughts and behaviour toward the past, present, or future [12, 13]. Future-oriented individuals tend to establish longer-term goals, delay immediate gratification, and maintain behaviours associated with future benefits, whereas present-oriented individuals are more strongly influenced by immediate experiences and enjoyment. Maintaining an active lifestyle may involve both longer-term commitment and immediate motivational rewards.

Recent studies further indicate that future-oriented thinking is linked to self-regulatory psychological resources. Among college students, Zhu et al. [14] found that future time perspective was positively related to academic self-efficacy, with personal growth initiative and learning engagement contributing to this association. In a sport context, Yiyi et al. [15] similarly reported positive associations between future time perspective and self-efficacy among adolescent athletes. Although these studies examined outcomes other than physical literacy, they support the broader proposition that future orientation and efficacy beliefs may operate as interconnected resources for sustained, goal-directed behaviour.

Previous research has therefore linked self-efficacy and future-oriented thinking to physical activity, sport-related outcomes, and sustained goal-directed behaviour. However, considerably less is known about their simultaneous associations with physical literacy, particularly when multiple dimensions of time perspective are considered alongside general self-efficacy. The present study examined the simultaneous associations of general self-efficacy and five dimensions of time perspective with perceived physical literacy.

Methods

Study design and participants

This cross-sectional study was conducted online as part of a larger research project examining psychological and behavioural characteristics related to entrepreneurship and proactive functioning across a heterogeneous population. Data were collected between December 2025 and March 2026. The full project dataset comprised 1,775 participants recruited through an online survey whose link was distributed by university students. The present analysis used a subset of 593 participants who completed the measures relevant to this study and had complete data on all study variables. Participants ranged in age from 17 to 65 years (M = 34.10, SD = 13.22); 60.9% were women and 39.1% were men.

Procedure and ethical considerations

The questionnaire was administered online. Participation was voluntary and anonymous, and participants were informed about the purpose of the study, anonymous handling of responses, and their right to discontinue participation without consequences. Electronic informed consent to participate was obtained before the questionnaire was completed. The study was approved by the Ethics Committee of the Faculty of Law and Business Studies Dr Lazar Vrkatić, Novi Sad, Serbia (Approval No. 97/25, 23 April 2025). The approved protocol included adolescent participants; the Ethics Committee approved their anonymous participation without requiring separate parental consent. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki.

Measures

Perceived physical literacy. Perceived physical literacy was assessed using the six-item Serbian version of the Portuguese Physical Literacy Assessment (PPLA-6). The psychometric properties of the Serbian version have been reported previously [16]. Higher scores indicate higher perceived physical literacy. Internal consistency in the present sample was acceptable (Cronbach's α = .773).

General self-efficacy. General self-efficacy was assessed using the 10-item General Self-Efficacy Scale (GSE) [17]. Items are rated on a four-point scale, with higher scores indicating stronger generalized self-efficacy. Internal consistency in the present sample was good (Cronbach's α = .864).

Time perspective. Time perspective was assessed using the 15-item Serbian short version of the Zimbardo Time Perspective Inventory (ZTPI-15) [18], developed from the previously adapted 52-item Serbian version of the original 56-item ZTPI [12]. The instrument assesses five dimensions: Past-Positive, Future, Present-Hedonistic, Present-Fatalistic, and Past-Negative. Items are rated from 1 to 5, with higher subscale scores indicating a stronger expression of the respective temporal orientation. Cronbach's α coefficients in the present sample were .621 for Past-Positive, .615 for Future, .716 for Present-Hedonistic, .593 for Present-Fatalistic, and .845 for Past-Negative. Given that each subscale contains only three items, these coefficients were interpreted with consideration of the small number of items per dimension.

Statistical analysis

Analyses were conducted in R using the lavaan package [19]. Confirmatory factor analyses were conducted for the measurement models of perceived physical literacy, general self-efficacy, and time perspective before specification of the structural model. Following inspection of modification indices, residual covariances were allowed between PPLA-6 items 1 and 2 and between items 5 and 6; in the time-perspective measurement model, a residual covariance was allowed between items 2 and 14 and item 13 was allowed to cross-load on the Past-Negative factor. These specifications were retained in the structural model. The structural model simultaneously examined the associations of general self-efficacy and the five time-perspective dimensions with perceived physical literacy. Robust maximum likelihood estimation (MLR) was used. Model fit was evaluated using the χ^2 statistic, comparative fit

index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). Standardized parameter estimates and the proportion of explained variance (R^2) in perceived physical literacy were reported.

Use of generative artificial intelligence

During manuscript preparation, ChatGPT (OpenAI) was used for language editing, organizational support, and consistency checking. The author independently reviewed and verified the scientific content, analyses, references, and final wording and takes full responsibility for the manuscript.

Results

The structural equation model showed acceptable overall fit, $\chi^2(409) = 795.027$, CFI = .922, TLI = .912, RMSEA = .042 (90% CI .038–.047), and SRMR = .048. General self-efficacy showed the strongest positive association with perceived physical literacy ($\beta = .330$, $p < .01$). Among the time-perspective dimensions, Future Orientation ($\beta = .202$, $p < .05$) and Present-Hedonistic Orientation ($\beta = .207$, $p < .05$) were positively associated with perceived physical literacy. Past-Positive, Present-Fatalistic, and Past-Negative orientations were not statistically significant. Together, general self-efficacy and the five time-perspective dimensions accounted for 35.8% of the variance in perceived physical literacy ($R^2 = .358$). Table 1 presents the standardized structural coefficients and model-fit indices.

Table 1
Structural equation model of perceived physical literacy, self-efficacy, and time perspective

Predictor / model fit	Perceived physical literacy
General Self-Efficacy	.330**
ZTPI-15	
Past-Positive (PP)	.075
Future (F)	.202*
Present-Hedonistic (PH)	.207*
Present-Fatalistic (PF)	−.119
Past-Negative (PN)	−.037
R^2	.358
χ^2 (df)	795.027 (409)
CFI	.922
TLI	.912
RMSEA (90% CI)	.042 (.038, .047)
SRMR	.048
Note. Standardized regression coefficients are reported. **p < .01; *p < .05.	

Discussion

The present study examined the simultaneous associations of general self-efficacy and five dimensions of time perspective with perceived physical literacy. Three main findings emerged. General self-efficacy showed the strongest positive association with perceived physical literacy, while Future and Present-Hedonistic orientations also showed significant positive associations. Together, these psychological characteristics accounted for 35.8% of the variance in perceived physical literacy.

General self-efficacy emerged as the strongest psychological correlate of perceived physical literacy. This finding is consistent with Social Cognitive Theory [7–9], which emphasizes efficacy beliefs as important for motivation, persistence, and self-regulation. Individuals who perceive themselves as generally capable of managing demands and achieving desired outcomes may also be more likely to perceive themselves as competent, confident, and able to engage effectively in physical activity. Recent research has similarly linked self-efficacy with physical activity and exercise-related psychological processes, although the strength and nature of these associations appear to depend on the population and broader psychological model [10, 11].

Future Orientation was also positively associated with perceived physical literacy. A stronger future orientation involves greater attention to future consequences, planning, and goal-directed behaviour. Such an orientation may be relevant to behaviours whose benefits accumulate over time, including regular physical activity and maintenance of physical competence. Previous research has connected future-oriented thinking with self-regulatory and motivational processes, including self-efficacy and sustained goal-directed behaviour [14, 15]. The present findings extend this perspective by showing that Future Orientation is uniquely associated with perceived physical literacy when general self-efficacy and the remaining time-perspective dimensions are considered simultaneously.

Present-Hedonistic Orientation also showed a positive association with perceived physical literacy. Although future orientation and present hedonism may appear conceptually different, their simultaneous positive associations are not necessarily contradictory. Future orientation may support sustained engagement through planning and anticipated benefits, whereas a hedonistic orientation may facilitate engagement when physical activity is experienced as enjoyable, stimulating, or intrinsically rewarding. From this perspective, perceived physical literacy may be associated both with valuing future outcomes and with deriving immediate enjoyment from physical activity.

In contrast, Past-Positive, Present-Fatalistic, and Past-Negative orientations did not show statistically significant unique associations with perceived physical literacy in the multivariable model. These findings should not be interpreted as evidence that these temporal orientations are unrelated to physical activity or psychological functioning more broadly. Rather, they indicate that these dimensions did not explain additional variance in perceived physical literacy after general self-efficacy and the other dimensions of time perspective were considered simultaneously.

Taken together, the findings suggest that perceived physical literacy is associated with a combination of general confidence in one's capabilities and particular ways of orienting toward time. The results do not support a single temporal profile associated with higher perceived physical literacy. Instead, both future-oriented goal regulation and present-focused enjoyment appear relevant. This combination is compatible with a view of sustained physical engagement in which individuals may benefit both from anticipating longer-term outcomes and from experiencing physical activity as immediately rewarding.

Practical implications

The findings may have implications for programmes aimed at supporting physical literacy and sustained engagement in physical activity. Approaches that strengthen confidence in one's capacity to engage in physical activity may be particularly relevant. Interventions could also examine whether combining future-oriented strategies, such as goal setting and planning, with opportunities for immediate enjoyment and intrinsically rewarding physical experiences supports physical literacy. Because the present findings are cross-sectional, these implications should be regarded as hypotheses for future intervention research rather than evidence of intervention effects.

Limitations and future directions

Several limitations should be considered. First, the cross-sectional design precludes conclusions about directionality or causality. Longitudinal and experimental studies are needed to determine whether self-efficacy and time perspective contribute to changes in physical literacy over time, whether physical literacy contributes to these psychological characteristics, or whether the associations are reciprocal. Second, all constructs were assessed using self-report measures, which may increase shared-method variance and do not provide an objective assessment of physical competence or physical activity. Third, recruitment through an online survey distributed by university students means that the sample should not be regarded as representative of the general population. Although the broad age range increases heterogeneity, the present study did not test whether associations differed across age groups. Fourth, the measurement model included data-driven residual covariances and a cross-loading identified through modification indices; replication of the measurement and structural model in an independent sample is therefore warranted. Future studies should also incorporate contextual variables such as social support, educational environments, and access to opportunities for physical activity.

Conclusions

General self-efficacy, Future Orientation, and Present-Hedonistic Orientation were positively associated with perceived physical literacy, together accounting for 35.8% of its variance. The findings highlight the relevance of both perceived personal capability and temporal orientation for understanding individual differences in perceived physical literacy. Future longitudinal and intervention research is needed to clarify the direction of these associations and determine whether they generalise across age groups and independently recruited populations.

Abbreviations

CFI
Comparative Fit Index
CFA
Confirmatory Factor Analysis
GSE
General Self-Efficacy Scale
MLR
Robust Maximum Likelihood
PL
Physical Literacy
PPLA-6
six-item Serbian version of the Portuguese Physical Literacy Assessment
RMSEA
Root Mean Square Error of Approximation

SEM
Structural Equation Modeling
SRMR
Standardized Root Mean Square Residual
TLI
Tucker-Lewis Index
ZTPI-15
15-item Serbian short version of the Zimbardo Time Perspective Inventory.

Declarations

Ethics approval and consent to participate

The study was approved by the Ethics Committee of the Faculty of Law and Business Studies Dr Lazar Vrkatić, Novi Sad, Serbia (Approval No. 97/25, 23 April 2025). Participation was voluntary and anonymous. Electronic informed consent to participate was obtained before questionnaire completion. The approved protocol included adolescent participants, and the Ethics Committee approved their anonymous participation without requiring separate parental consent. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki.

Consent for publication

Not applicable.

Availability of data and materials

The dataset used and analysed during the current study is available from the corresponding author on reasonable request.

Competing interests

The author declares that she has no competing interests.

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Authors' contributions

A.G. contributed to the conceptualization of the study, supervision, and writing–review and editing. J.N. contributed to the methodology, investigation, data curation, formal analysis, and writing–original draft preparation. D.V.K., M.B., J.P., M.I., and Ž.B. contributed to the validation of the research findings and writing–review and editing. All authors read and approved the final manuscript.

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