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MOTIVATION PROFILES OF PHYSICAL EDUCATION TEACHERS IN SERBIA: A SELF-DETERMINATION THEORY PERSPECTIVE

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Abstract

Understanding the motivations of physical education teachers is essential for effective teaching and professional well-being. Grounded in Self Determination Theory, this study examined the interplay between intrinsic and extrinsic motivation among 3,792 physical education teachers in Serbia to identify four profiles: amotivated n = 380, 10.0 percent; extrinsically motivated n = 909, 24.0 percent; intrinsically motivated n = 946, 24.9 percent; and balanced n = 1,557, 41.1 percent. Structural Equation Modeling generated standardized latent scores with excellent model fit CFI = .987, TLI = .991, RMSEA = .045, SRMR = .051. These scores were used to compute a Motivation Index and conduct multinomial ridge regression classification, yielding overall accuracy of 78.43 percent and balanced accuracy of 80.14 percent for amotivated, 87.03 percent for balanced, 87.23 percent for extrinsic, and 95.37 percent for intrinsic profiles. Simultaneously, high intrinsic and extrinsic motivation increased the odds of balanced classification ($\beta = 0.30$ to 0.34, OR approximately 1.4, $p < .01$), indicating a synergistic configuration in which external demands are internalized. Low intrinsic and extrinsic motivation predicted amotivation ($\beta = 1.10$, OR = 3.00, $p < .001$). Higher extrinsic motivation reduced the probability of intrinsic dominance ($\beta = -0.95$, OR = 0.39, $p < .001$), and tempered extrinsic classification ($\beta = -0.27$, OR = 0.77, $p < .001$). Teachers classified as extrinsic reported high scores on both dimensions, with extrinsic motivation prevailing, whereas intrinsic dominance was most likely when intrinsic motivation was strong and extrinsic motivation comparatively lower. Higher personal physical activity and rural context favored intrinsic orientation, while greater teaching experience and classroom teacher status were negatively associated with it. These

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findings clarify the motivational structure of physical education teachers and identify targets for professional development and policy aimed at strengthening autonomous yet context-sensitive motivation.

Key words: physical education teachers, motivation, Self-Determination Theory, extrinsic motivation, intrinsic motivation, motivation index.

МОТИВАЦИОНИ ПРОФИЛИ НАСТАВНИКА ФИЗИЧКОГ ВАСПИТАЊА У СРБИЈИ: ПЕРСПЕКТИВА ТЕОРИЈЕ САМОДЕТЕРМИНАЦИЈЕ

Апстракт

Разумевање мотивације наставника физичког и здравственог васпитања од суштинског је значаја за квалитет наставе и професионално благостање. Заснована на Теорији самодетерминације, ова студија испитала је међудејство интринзичне и екстринзичне мотивације код 3,792 наставника у Србији ради идентификације четири профила: амотивисани (n = 380, 10.0%), екстринзички мотивисани (n = 909, 24.0%), интринзички мотивисани (n = 946, 24.9%) и уравнотежени (n = 1,557, 41.1%). Структурални модели једначина показали су одлично уклапање модела (CFI = .987, TLI = .991, RMSEA = .045, SRMR = .051). Стандардизовани факторски скореви коришћени су за израчунавање Индекса мотивације и мултиномијалну ridge регресију, са укупном тачношћу класификације од 78.43% и уравнотеженом тачношћу од 80.14% за амотивисани, 87.03% за уравнотежени, 87.23% за екстринзички и 95.37% за интринзички профил. Истовремено високи нивои интринзичне и екстринзичне мотивације повећавали су вероватноћу припадности уравнотеженом профилу ($\beta = .30–.34$, $OR \approx 1.40$, $p < .01$), указујући на синергијску конфигурацију у којој се спољашњи захтеви интернализују. Ниски нивои обе димензије предвиђали су амотивацију ($\beta = 1.10$, $OR = 3.00$, $p < .001$). Виши ниво екстринзичне мотивације умањивао је вероватноћу интринзичке доминације ($\beta = −.95$, $OR = 0.39$, $p < .001$) и екстринзичке класификације ($\beta = −.27$, $OR = 0.77$, $p < .001$). Наставници сврстани у екстринзички профил испољавали су високе апсолутне вредности обе димензије, при чему је екстринзична мотивација доминирала, док је интринзички профил био највероватнији код наставника са снажном интринзичном и релативно нижом екстринзичном мотивацијом. Виши ниво личне физичке активности и рурални контекст били су повезани са интринзичном оријентацијом, док су веће наставничко искуство и статус наставника разредне наставе били негативно повезани са њом. Ови налази мапирају комплексну мотивациону структуру наставника физичког и здравственог васпитања и указују на конкретне правце образовних политика и професионалног развоја усмерене ка јачању аутономне, али контекстуално усклађене мотивације.

Кључне речи: наставници физичког и здравственог васпитања, мотивација, теорија самодетерминације, спољашња мотивација, унутрашња мотивација, индекс мотивације.

INTRODUCTION

Motivation is a fundamental aspect of human behaviour and performance, particularly in the educational sphere, where it affects students' engagement and teachers' professional growth, instructional effectiveness, and long-term job satisfaction. One might argue that the role of physical education (PE) teachers is unique due to the embodied, affective, and often socially dynamic nature of their work. Unlike other subjects, PE requires teachers to promote both cognitive and physical engagement in students while ensuring their physical health and active participation in movement-related activities. In this setting, understanding what motivates PE teachers is essential, not only for enhancing their instructional methods and well-being but also for fostering a learning environment that inspires students to adopt active lifestyles. This is especially important in school sports, which have been shown to influence students' and teachers' motivational orientation through structured participation and engagement in extracurricular sports programs (Mitić et al., 2023). Despite increasing research focusing on student motivation in physical education contexts (e.g., Van Doren et al., 2021; Huéscar Hernández et al., 2019), the motivational dynamics of PE teachers themselves remain largely unexamined. This gap is significant. As the Self-Determination Theory (SDT) posits, the quality of motivation, mainly whether it is autonomous (intrinsic) or controlled (extrinsic), profoundly affects both the experience and the outcomes of any activity (Deci & Ryan, 1985; Ryan & Deci, 2000). Autonomously motivated teachers exhibit tremendous enthusiasm, creativity, and persistence, while those motivated by external contingencies may be more susceptible to burnout, disengagement, and lower instructional quality (Roth et al., 2007; Hein et al., 2012). Howard et al. (2020) argue that motivation operates along a continuum, ranging from amotivation (lack of intent to act) to highly autonomous motivation (intrinsic interest and identification). We should note a critical argument that individuals often display blended motivational profiles rather than purely intrinsic or extrinsic motives. According to SDT, the way teachers interact with students, through autonomy-supportive, structuring, or relatedness-supportive behaviours, plays a critical role in shaping students' motivational orientation (Van den Berghe et al., 2013). Autonomy-supportive teaching, for instance, involves nurturing students' interests and offering meaningful choices (Reeve, 2009), whereas structuring behaviours provides clarity and constructive feedback (Vasconcellos et al., 2020). Conversely, need-thwarting styles, characterised by controlling, chaotic, or emotionally cold behaviours, have been associated with increased controlled motivation and decreased motivation among students. These dynamics can be exacerbated by perceived administrative pressure, which has been shown to undermine teachers' autonomy and increase controlling instructional styles (Pelletier, Séguin-Lévesque, & Legault, 2002). These motivational climates have downstream effects on

students' physical activity, well-being, and PE engagement, highlighting teacher motivation's broader impact on educational and health outcomes (Ryan & Deci, 2000). While this growing body of work reveals the importance of teachers' instructional styles, there is a relative scarcity of studies examining how teachers' motivation interacts with their professional context and behaviours. This study fills that gap by examining the interplay between intrinsic and extrinsic motivation among PE and classroom teachers toward school sports while exploring the demographic and behavioural factors, such as physical activity and teaching role, which may support or undermine their motivational profiles.

Understanding this motivational interplay is particularly salient in Serbia, where educational reforms, resource limitations, and policy shifts have increased the demands on teachers. We should also note that a unique feature of the Serbian educational system is that general classroom teachers typically teach physical education classes in grades 1 through 4. In contrast, specialised physical education (PE) teachers assume their responsibilities from the fifth grade. This structural differentiation can result in varying levels of competence, professional identity, and motivation among classroom and physical education teachers. Additionally, a significant challenge for physical education teachers in Serbia is their need to work across multiple educational institutions and different settlement settings, along with the challenges posed by poorly equipped gym facilities and the widespread undervaluation of physical education as an essential subject. Under these conditions, motivation emerges as an intrinsic driver of professional engagement and a protective factor against systemic challenges and stressors. In this landscape, school sports play a vital role in the educational experience, providing students with unique opportunities for physical development, social integration, and emotional well-being (Bailey et al., 2009; Eime et al., 2013). However, the quality and sustainability of school sports programs depend heavily on the motivation and commitment of the teachers who lead them. Teachers' engagement in school sports often extends beyond regular teaching duties, requiring additional time, emotional investment, and organisational effort (Morgan & Hansen, 2008). Consequently, understanding the motivations that prompt educators to engage in school sports, especially in environments characterised by resource scarcity and institutional limitations, is essential for devising effective and sustainable strategies that enhance teacher well-being and student outcomes. Research has shown that intrinsically motivated teachers experience greater professional fulfilment and are likelier to create autonomy-supportive environments that benefit student participation and motivation in school sports (Van den Berghe et al., 2013; Deci & Ryan, 1985). At the same time, extrinsic motivators such as recognition, institutional support, or opportunities for professional development can also sustain teacher engagement when internal resources are low (Vasconcellos et al., 2020).

Despite these challenges, empirical evidence on the motivational landscape of Serbian PE teachers is scarce, particularly in how intrinsic and extrinsic motivational dimensions interact to form dominant motivational profiles. Moreover, while international studies have established links between teaching experience, gender, school setting, and motivational tendencies (Kasimoglu, 2021; Uğraş & Ozen, 2019), their findings are often context-specific and may not translate directly to the unique sociocultural and educational environment of Serbia. There is also an emerging recognition that the physical activity levels of teachers themselves may reflect and reinforce intrinsic motivation, yet empirical studies that examine this relationship remain limited (Koka, 2013; Van den Berghe et al., 2013). Another critical gap in the literature involves methodological robustness. Traditional research often classifies teachers into motivational types using single-score cut-offs, such as the Relative Autonomy Index (Grolnick & Ryan, 1987). While informative, these methods may oversimplify the complex interaction between motivational types and fail to capture the intensity or dominance of one type over the other. A more sophisticated, multidimensional approach is needed to account for the strength and direction of motivation. The present study addresses this gap by employing a Motivation Index derived from standardised factor scores based on Self-Determination Theory constructs, enabling a richer classification of motivational profiles.

In light of the theoretical significance, contextual urgency, and methodological innovation, the aim of the present study is twofold: (1) to investigate the interaction between intrinsic and extrinsic motivation in predicting dominant motivation profiles among PE teachers in Serbia, and (2) to examine how demographic and behavioural variables such as gender, teaching experience, physical activity levels, and school context contribute to the likelihood of classification into one of four motivational categories: intrinsic, extrinsic, balanced, or amotivated. Through this approach, the study not only tests the continuum hypothesis proposed by SDT in a novel population but also provides a robust framework for future research and intervention in teacher motivation.

METHODS

Study Design and Data Collection

This study examined the relationship between demographics (gender, settlement type, teaching experience, and teacher role) and physical activity levels, as well as their impact on motivations (intrinsic, extrinsic, balanced, and amotivated) among Serbian physical education teachers. Conducted in May 2022, it was part of a national initiative aimed at understanding the demographics and lifestyle habits of Serbia's physical and health education teachers regarding school sports. At the outset of its new

School Sport Strategy, the Serbian Ministry of Education formed a working group to map teachers' motivational profiles nationwide. The group, advised by the Institute for the Evaluation of the Quality of Education and Upbringing, first defined a sampling frame that included every one of Serbia's 29 administrative districts. Within each district, the Institute selected a proportional set of schools, ranging from large to small, urban to rural, and primary to secondary, so that the composition of the invited sample reflected the actual distribution of schools. The Ministry then issued an official circular authorising those schools to participate and instructing their principals to disseminate the online questionnaire to all physical education staff. Because every district was covered and the within-district selection matched the Ministry's enrolment statistics, the resulting 4,595 completed inventories constitute a regionally representative picture of PE teachers across Serbia. We collected data with a self-developed questionnaire to gather information about teachers' backgrounds and physical activity. The survey was distributed via Google Forms to schools' official emails, allowing teachers to respond at their own pace with guaranteed anonymity. Incomplete or unclear questionnaires were excluded to maintain data quality. The study adhered to the principles outlined in the Declaration of Helsinki, and the methodology was thoroughly documented and shared with participants to ensure transparency. Statistical methods were described to analyse data, and self-reported biases were acknowledged as limitations. Participants were informed about the study's goals, with a focus on improving physical education and school sports standards in Serbia, encompassing both regular classes and extracurricular activities tied to the curriculum. All ethical concerns were addressed to maintain integrity and participant well-being.

Participants

We began with 4,595 returned questionnaires. After quality screening, 3,792 cases (82.6%) were included in the analysis. The exclusion criteria were derived from the detection of multivariate outliers using the Mahalanobis distance at $p < .001$, resulting in the exclusion of 803 participants. Therefore, the research involved 3,792 physical and health education teachers in Serbia, with 1,095 men (28.9%) and 2,697 women (71.1%). Experience varied: 776 teachers (20.5%) had up to 10 years of experience, 928 (24.5%) had 11 to 20 years, 1,266 (33.4%) had 21 to 30 years, and 822 (21.7%) had more than 30 years of experience. Regarding physical activity, 196 teachers (5.2%) were inactive, 1,197 (31.6%) had low activity, 2,048 (54.0%) were moderately active, and 351 (9.3%) were highly active. The sample consisted of 1,917 teachers (50.6%) from urban areas and 1,875 (49.4%) from rural areas. Of these, 1,321 participants (34.8%) were physical education teachers, while 2,471 (65.2%) were classroom teachers. Data was collected via email correspondence initiated by school administrators under the Ministry of Education. The study covered all districts and mu-

nicipalities in Serbia to ensure sample representativeness. The Institute for the Evaluation of the Quality of Education and Upbringing managed the data collection and electronic database. This comprehensive methodology, which covered a wide range of teachers nationwide, ensured that the findings accurately reflected the population. Ethical considerations were upheld; all participants were informed and volunteered, maintaining the objectivity and reliability of results for meaningful conclusions.

Development and Validation of the Teacher Motivation for School Sports Questionnaire (TMSSQ)

During the instrument-development phase, we first assembled a five-member panel, comprising one psychologist from the Institute for the Evaluation of the Quality of Education and Upbringing, one university professor, a sports psychologist, and three PE teachers from the Serbian Association of Physical Education and Sport teachers. Guided by semi-structured interviews with eighteen teachers drawn from different districts, the panel distilled five motivational domains: interest-enjoyment, perceived competence, social recognition, material incentives, and institutional working conditions. To ground each domain in the Self-Determination Theory, we then searched the published literature for established SDT instruments and primarily relied on the Sport Motivation Scale-II (Pelletier et al., 2013) and the Teacher Motivation Inventory (Roth et al., 2007), adapting the wording to Serbian school terminology. Each draft statement was rated for clarity, cultural suitability, and uniqueness to allow later psychometric pruning. We deliberately retained a generous pool of thirty-four items, seventeen intended to capture intrinsic and seventeen extrinsic motivation. Responses were collected using a five-point Likert scale from 'Strongly Disagree' to 'Strongly Agree.' An exploratory factor analysis (EFA) validated the structure with a Kaiser-Meyer-Olkin (KMO) measure of .99, indicating excellent factorability. Bartlett's test was significant ($\chi^2(33) = 666.57$, $p < .001$). A principal axis factoring extraction method with oblimin rotation revealed a two-factor structure explaining 73.6% of the total variance. Items with commonalities < .40 were removed. A confirmatory factor analysis (CFA) was conducted to evaluate the adequacy of the two-factor model using a diagonally weighted least squares (WLSMV) estimator. We used the WLSMV estimator because all 34 items are five-point ordinal variables. WLSMV treats such data as categorical, computes polychoric correlations, and applies mean and variance-adjusted χ^2 statistics, producing unbiased loadings and robust standard errors under non-normality. This approach offers advantages that conventional ML does not provide for Likert-type items. While the chi-square test was significant ($\chi^2(83) = 2366.82$, $p < .001$), other fit indices indicated excellent model fit: comparative fit index (CFI) = .999, Tucker-Lewis index (TLI) = .999, and root mean square error of approximation (RMSEA) = .085. High CFI and TLI indicate a

well-fitting model, while RMSEA and standardised root mean square residual (SRMR) values support this fit. Intrinsic motivation loadings ranged from .89 to .97; extrinsic motivation loadings ranged from .55 to .91. The covariance between intrinsic and extrinsic motivation latent variables was significant (r = .65, p < .001). The final model had nine distinct intrinsic and six extrinsic motivation items. Standardised Cronbach's alpha was 0.98 for intrinsic and 0.82 for extrinsic, with average inter-item correlations

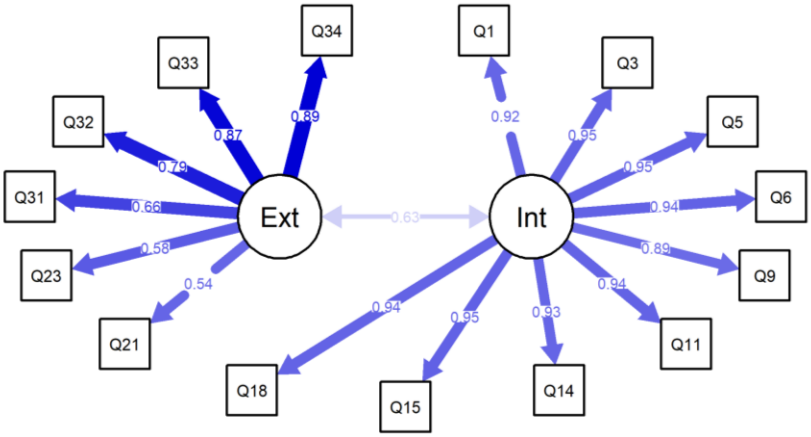

Figure 1. Structural Equation Model (SEM) depicting the relationships between Intrinsic and Extrinsic Motivation in school sports. Observed variables (items) are represented as squares, while latent factors (Intrinsic and Extrinsic Motivation) are represented as circles. Standardised parameter estimates are shown on the paths, and double-headed arrows indicate correlations between latent variables and covariances between selected observed variables. Intrinsic Motivation includes the following items: Q1 (I am interested in working in school sports), Q3 (I enjoy teaching students new skills in school sports), Q5 (I feel happy when conducting a school training session), Q6 (I feel excited when preparing a team for a school sports competition), Q9 (The thought of school sports brings me pleasant emotions), Q11 (I feel comfortable while working in a school sports club), and Q14 (I take pride in leading a team in an interschool sports competition), Q15 (Working in school sports makes me feel competent) and Q18 (Student praise inspires me to work in school sports). Extrinsic Motivation consists of the following items: Q21 (Success in school sports brings me certain material benefits, which motivate me to work in this field), Q23 (I expect to receive financial compensation for my work in school sports), Q31 (The gym in my school is adequately equipped for school sports, which inspires me to be more engaged), Q32 (My school has enough sports fields in the yard for school sports, which inspires me to be more engaged), Q33 (My school can become a model institution for school sports, which inspires me to be more engaged), and Q34 (Victory in school sports competitions makes me feel satisfied).

of 0.85 and 0.44. The TMSSQ effectively measures teachers' motivation for school sports, distinguishing between intrinsic and extrinsic dimensions. We acknowledge, however, that we have not yet tested external aspects of validity. The absence of convergent or discriminant evidence should be noted as a limitation, and we recommend that future work correlate the scale with related constructs to extend its nomological network.

Statistical Analyses

Statistical analyses were performed using R (version 4.2.0; RStudio 2024.12.1+563). Multivariate outliers were identified with Mahalanobis distance and removed for robustness. An exploratory and confirmatory factor analysis validated the two-factor model of the motivation questionnaire, comprising intrinsic and extrinsic motivation. Categorical variables were converted to factors, treating teaching experience and physical activity levels as ordered factors. Confirmatory factor analysis (CFA) was used with the lavaan package (version 0.6-19) to estimate latent variables. A structural equation model (SEM) was fitted with a weighted least squares mean- and variance-adjusted estimator (WLSMV), incorporating gender, teaching experience, physical activity level, settlement type, and teacher type as predictors, with freely estimated covariance between latent factors. Standardised factor scores were rescaled using z-scores. Data transformation included standardising variables and computing a Motivation Index, which reflects the balance between intrinsic and extrinsic motivation. This index was calculated as the standardised difference between intrinsic and extrinsic motivation, weighted by their absolute magnitudes to reflect the relative strength of each type of motivation. Participants were classified into four motivation profiles: intrinsic (upper quartile), extrinsic (lower quartile), balanced (interquartile range), and amotivated (bottom decile). A penalised multinomial logistic regression (ridge) was fitted on a stratified 70 % training subset ($N = 2{,}654$) and evaluated on the remaining 30 % hold-out subset ($N = 1{,}138$). The design matrix contained the main effects and interactions of the standardised intrinsic and extrinsic factor scores, together with the demographic covariates, and the optimal penalty ($\lambda = 0.02$) was chosen by ten-fold cross-validation within the training data. All model performance indices reported below refer to the untouched test set. The model was then refitted using the selected lambda and bootstrapped with 1,000 resamples on the entire dataset to estimate confidence intervals and standard errors. Coefficients were exponentiated to obtain odds ratios, and model performance was evaluated using a confusion matrix to compare predicted and observed profiles. Final coefficients, standard errors, odds ratios, and significance levels were reported for each outcome category.

RESULTS

The two-factor SEM was estimated with WLSMV in lavaan (version 0.6-19). Overall fit was excellent (*CFI* = .987, *TLI* = .991, *RMSEA* = .045, 90 % *CI* [.04, .05]). All indicators loaded significantly on their intended factors. For the intrinsic motivation factor, standardised loadings (λ) ranged from .87 to .95, while for extrinsic λ ranged from .48 to .84. The latent variables were moderately correlated ($r = .66$, $p < .001$). Covariates were allowed to predict both factors (see Figure 2). After standardisation, higher habitual physical activity was associated with higher intrinsic motivation ($\beta = .10$, $SE = .03$, $z = 5.27$, $p < .001$), whereas greater teaching experience was associated with lower intrinsic motivation ($\beta = –.09$, $SE = .02$, $z = –5.37$, $p < .001$). Gender (female) showed a small non-significant negative effect ($\beta = –.04$, $p = .054$), while settlement type and teacher type were negligible ($|\beta| \leq .02$, $ps > .29$). For extrinsic motivation, experience again showed a negative association ($\beta = –.07$, SE = .02, z = –3.84, p < .001), while physical activity had a positive effect ($\beta = .06$, SE = .02, $z = 3.04$, $p = .002$). Moreover, rural settlement was associated with slightly lower extrinsic scores ($\beta = –0.06$, $p < 0.001$), but the gender and teacher type were non-significant ($|\beta| \leq 0.04$, $ps > 0.06$). Together, the covariates explained 2.9% and 1.3% of the variance in intrinsic and extrinsic motivation, respectively.

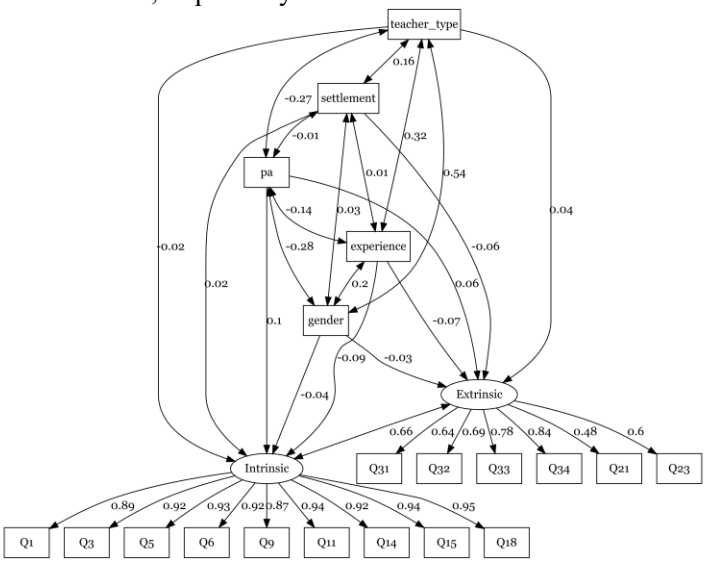

Figure 2. Structural equation model (WLSMV estimator) illustrating the two latent factors (intrinsic and extrinsic motivation) with standardised factor loadings on their respective items, as well as standardised regression paths from gender, teaching experience, physical activity level, settlement type, and teacher type to each factor. The double-headed arrow represents the latent correlation. All numeric values on the paths are fully standardised estimates.

Having verified the two-factor structure and extracted the standardised latent scores, we converted these scores into the four motivation profiles (amotivated, balanced, extrinsic, and intrinsic) and then modelled profile membership with a penalised multinomial ridge regression. The optimal λ value ($\lambda = 0.02$) was selected using ten-fold cross-validation. The model achieved a deviance of 47.73, indicating a strong balance between fit and complexity, with an accuracy of 78.43% and balanced accuracy scores of 87.03% (amotivated), 80.14% (balanced), 87.23% (extrinsic), and 95.37% (intrinsic). Significant predictors for dominant motivation included intrinsic and extrinsic motivations. In the amotivated group, low levels of both motivations ($\beta = 1.10$, $OR = 3.00$, $p < .001$) increased the likelihood of classification as amotivated, suggesting a compounded motivational deficit. In the balanced group, both intrinsic ($\beta = 0.34$, $OR = 1.40$, $p < .001$) and extrinsic motivation ($\beta = 0.30$, $OR = 1.35$, $p = .002$) were positively associated with classification, indicating that higher levels of both motivational dimensions increase the likelihood of being categorised

Figure 3. Significant Predictors of Dominant Motivation Profiles Among Physical Education Teachers. This forest plot displays the significant predictors of dominant motivation categories (Amotivated, Balanced, Extrinsic, and Intrinsic) identified through multinomial ridge regression. Odds ratios (OR) and 95% confidence intervals (CIs) are presented on a log scale. Only predictors with statistically significant effects ($p < .05$) are shown, along with the interaction term between intrinsic and extrinsic motivation. Reference lines at OR = 1 indicate no effect. Positive associations are interpreted as indicating an increased likelihood of classification into a specific motivational category. Predictors include physical activity level, settlement type, teaching role, and linear teaching experience, with categories color-coded for clarity.

as balanced. Significant interaction effects revealed that for individuals classified as extrinsically motivated, the combined presence of high intrinsic and extrinsic motivation reduced the probability of classification (β = –0.27, *OR* = 0.77, $p < .001$) despite the strong positive main effect of extrinsic motivation. In the Intrinsic group, although intrinsic motivation strongly increased classification likelihood (β = 1.58, *OR* = 4.85, $p < .001$), higher extrinsic motivation, and especially their interaction (β = –0.95, *OR* = 0.39, $p < .001$), reduced the probability of intrinsic dominance, highlighting a motivational crowding effect.

Further significant findings related to motivation categories included that higher physical activity levels were positively associated with intrinsic motivation (β = 0.05, *OR* = 1.05, p = .012). Rural participants showed higher intrinsic motivation (β = 0.13, *OR* = 1.14, $p < .001$) and lower extrinsic motivation (β = -0.16, *OR* = 0.85, $p < .001$) compared to urban counterparts. Among intrinsic motivation, classroom teachers were less likely to be intrinsically motivated compared to PE teachers (β = -0.05, *OR* = 0.95, p = .015), and greater teaching experience was associated with lower intrinsic motivation (β = -0.09, *OR* = 0.92, p = .003). A marginal effect for gender indicated that females were less likely to be intrinsically motivated than males (β = -0.04, *OR* = 0.97, p = .052).

DISCUSSION

Theoretical Implications

This study makes a meaningful contribution to the literature on teacher motivation by examining how intrinsic and extrinsic motivational processes interact to shape dominant motivational profiles: amotivated, extrinsic, balanced, and intrinsic among physical education (PE) teachers. Consistent with the assumptions of Self-Determination Theory (Deci & Ryan, 1985; Ryan & Deci, 2000), our findings support the notion that motivation exists on a continuum of self-determination and that the interplay between intrinsic and extrinsic motivation has significant implications for teachers' professional engagement. The detection of significant interaction effects across all motivational profiles supports the continuum hypothesis (Howard et al., 2020), which emphasises the gradient nature of motivational regulations. Specifically, our results show that when intrinsic and extrinsic motivations are low, individuals are most likely to be categorised as amotivated, a state characterised by a lack of intention or purpose. This finding aligns with Howard et al.'s (2020) meta-analytic support for the Self-Determination Theory (SDT) continuum, which positions amotivation as the least self-determined and most disconnected form of motivation, opposite to intrinsic motivation. As Roth et al. (2007) highlight, such motiva-

tional deficits may reflect teacher disengagement or burnout, often rooted in systemic pressures that undermine autonomy and volitional engagement.

Our findings reinforce the growing body of literature that positions self-determined motivation as a cornerstone of quality teaching and learning in physical education. For instance, a comprehensive meta-analysis by Vasconcellos et al. (2020) systematically reviewed SDT applications in PE and found that autonomous motivation consistently predicted positive outcomes such as engagement, enjoyment, and adaptive learning behaviours, while controlled motivation and amotivation were linked to disengagement and maladaptive outcomes. These findings offer strong external validation for the continuum structure observed in our study and underscore the practical value of fostering self-determined forms of teacher motivation. Van den Berghe et al. (2013) also critically reviewed SDT-based interventions in PE settings and concluded that teacher behaviour is crucial in shaping motivational climates. Their work highlights that autonomy-supportive teaching strategies enhance student and teacher motivation, reinforcing the bidirectional nature of motivational dynamics in PE contexts. This is consistent with Reeve's (2009) assertion that teachers often adopt controlling styles due to pressure and habit. However, they can shift toward more autonomy-supportive practices with appropriate training and support. Therefore, we can point to theoretical implications for how teacher motivation is shaped by and shapes the instructional climate, something our findings support, particularly in the interaction between motivational types and demographic or contextual factors.

Conversely, individuals with simultaneously high levels of intrinsic and extrinsic motivation were most likely to be classified as balanced. This challenges the traditional dichotomy that positions intrinsic and extrinsic motivation as incompatible and supports recent findings suggesting they coexist in an adaptive motivational profile (Huéscar Hernández et al., 2019; Roth et al., 2007). Such profiles may reflect teachers who internalise external demands while maintaining personal enjoyment and identification with their role. Similarly, our results showed that high extrinsic motivation reduced the likelihood of being classified as intrinsically motivated, reinforcing the notion of motivational crowding, whereby external pressures can undermine internal drive (Deci & Ryan, 1985). These patterns underscore the nuanced and interactive nature of teacher motivation and provide empirical support for using a Motivation Index grounded in the relative dominance and strength of intrinsic versus extrinsic factors, as opposed to categorical or unidimensional measures like the Relative Autonomy Index (Grolnick & Ryan, 1987). The approach taken in this study captures the complexity and fluidity of motivational profiles. It aligns well with recent person-centred perspectives in SDT (Howard et al., 2020), as well as the broader trend in physical education research toward multidimensional, interaction-sensitive models of motivation (Vasconcellos et al., 2020; Van den Berghe et al., 2013).

Demographic and Behavioural Correlates of Motivation

Several demographic and behavioural factors are significantly associated with dominant motivation types, offering insights into contextual influences on teacher motivation. Higher physical activity levels are associated with greater odds of intrinsic motivation (Teixeira et al., 2012), suggesting that PE teachers who engage in physical activity may identify more closely with movement and health promotion values, key aspects of the physical education (PE) curriculum. According to SDT, such alignment with personal values and perceived competence promotes internalisation and autonomous motivation (Deci & Ryan, 2000). While Koka (2013) emphasises students' perceptions, the study reveals that teacher behaviours, particularly those indicating autonomy support and social connectedness, are crucial for fostering intrinsic motivation in physical education. It also might imply that teachers' professional engagement is linked to the motivational quality of their interpersonal styles. Additionally, our findings indicate that rural teachers are more likely to be intrinsically motivated and less extrinsically motivated than their urban counterparts, likely reflecting cultural and systemic differences in school environments. Contextual elements like autonomy, supportive relationships, and minimised external performance pressures may lead to higher psychological need satisfaction (Van den Berghe et al., 2013; Hein et al., 2012). Rural schools could foster tighter-knit communities, greater lesson planning flexibility, and less bureaucratic oversight, which support intrinsic motivation. Conversely, our results showed that urban teachers were more likely to report higher levels of external regulation than their rural counterparts. While this distinction is not explicitly addressed in previous reviews, it is consistent with the Self-Determination theory, which posits that controlling and bureaucratic environments, often associated with accountability pressures and reduced autonomy, which research shows can lead to more controlled teaching behaviours and decreased teacher motivation (Pelletier et al., 2002; Vasconcellos et al., 2020). This contrast highlights the importance of autonomy-supportive climates for intrinsic motivation in both contexts.

Our findings revealed that classroom teachers without physical education specialisation were less intrinsically motivated than PE-trained teachers, underscoring the importance of professional identity and competence in fostering autonomy. SDT emphasises that competence in meaningful areas is vital for sustaining intrinsic motivation (Ryan & Deci, 2000). Teachers inadequately trained for PE may feel uncertain or lack enthusiasm, leaning on extrinsic motivators like duty or administrative expectations. Studies show that PE specialists report greater satisfaction, motivation, and engagement than classroom teachers (Breslin et al., 2012; Hein et al., 2012). Furthermore, our study found a negative link between teaching experience and intrinsic motivation; motivation often declines with years of service, particularly in low-autonomy, high-accountability

settings. Roth et al. (2007) showed that teachers lacking autonomy reported lower motivation and higher exhaustion. Retelsdorf et al. (2010) noted that teachers in low-track schools exhibited less teaching interest and more significant burnout, especially with maladaptive goals like work avoidance. Kasımoğlu (2021) found that intrinsic motivation in PE decreased with age and service years, related to desensitisation and unmet needs like poor facilities. Uğraş and Özen (2019) observed that PE teachers with over 10 years of experience had lower intrinsic motivation due to chronic frustrations such as lack of support. These studies illustrate how enduring unsupportive teaching environments reduce intrinsic motivation over time.

Although marginal, the observed gender difference shows that female teachers are less intrinsically motivated than males, warranting further reflection. In a male-dominated field of physical education, female educators may face challenges in expressing authority (Brown & Evans, 2004). Gendered expectations can impact women's autonomy and support at work. Societal roles, time constraints, and leadership disparities undermine women's motivation, especially in male-dominated areas like school sports. Our findings indicate that while no apparent gender disparity exists, they support the evidence that gender interacts with contextual and cultural factors affecting motivation (Ayık & Ataş, 2014; Van den Berghe et al., 2013). Overall, intrinsic motivation appears more sensitive to contextual and psychosocial factors, aligning with the view that it requires optimal conditions for maintenance (Deci & Ryan, 1985; Ryan & Deci, 2000). This sensitivity shows how demographic variables like school setting, physical activity, teaching experience, and role specialisation affect this motivational profile.

Conversely, extrinsic motivation remains stable, even in varying contexts, due to its detachment from personal values and psychological needs. This motivation might decline in Serbia, where the educational system lacks substantial external rewards. However, it seems to persist via introjected regulation, where teachers see expectations as obligations rather than personal choices (Deci & Ryan, 2000). This motivation may arise from professional duty, social pressures, or compliance rather than enthusiasm. In settings with limited advancement opportunities, extrinsic motivation might stabilise, reflecting minimum expectations for job performance. Adhering to policies and contractual obligations drives engagement, which explains the limited predictive value of demographic factors, such as teaching role or experience, for this motivation profile. Despite its complexity, no clear demographic or behavioural indicators emerged for the Balanced motivation group. This implies that balanced profiles encompass individuals with varying intrinsic and extrinsic motivations. The Self-determination theory (SDT) suggests this balance represents adaptive integration, where external regulations align with personal values (Ryan & Deci, 2000). Educators in this group can reconcile institutional demands with personal passion, showing adaptability. However, the absence

of clear predictors suggests a need for valid measures or qualitative insights to understand the development of this profile in different settings. Similarly, the Amotivated group lacks significant demographic predictors, raising theoretical and practical concerns. Amotivation signifies a lack of intention, with no strong links to contextual factors, suggesting it stems from emotional exhaustion or misalignment between personal values and job demands. Given its ties to disengagement and burnout (Roth et al., 2007), further exploration through longitudinal studies is essential to understand motivational decline over time. These findings suggest that intrinsic motivation is highly influenced by context and psychosocial factors, while extrinsic motivation is more stable, likely due to its dependence on social norms and obligations. Balanced and amotivated profiles are more nuanced and less tied to demographic characteristics. This asymmetry underscores the complexity of motivation in teaching and underscores the need to investigate how different motivations coexist, evolve, and interact with environmental conditions.

Methodological Contributions

Methodologically, this study advances the measurement of motivation by employing a Motivation Index derived from standardised factor scores obtained via structural equation modelling. Unlike traditional categorical classification or unweighted additive indices, this index reflects the direction (relative dominance of intrinsic vs. extrinsic) and intensity (total motivational strength) of individual motivation. This approach aligns with the continuum conceptualisation proposed by Howard et al. (2020) and is sensitive to motivational synergy and conflict. The multinomial ridge regression used in this study enabled simultaneous prediction of all four motivational categories while managing multicollinearity and improving generalisability through regularisation. The model's high classification accuracy and strong, balanced performance across all categories affirm the robustness of this analytic approach in modelling complex psychological constructs.

Educational and Policy Implications

The results carry important implications for teacher education, professional development, and school leadership. First, strategies to foster intrinsic motivation are urgently needed, particularly for experienced classroom teachers. These may include autonomy-supportive environments, meaningful professional development opportunities, recognition systems, and mentoring programs that affirm teachers' competence and foster a personal connection to their work. Second, the finding that rural teachers are more likely to be intrinsically motivated suggests that some elements of the rural teaching context may serve as protective factors. Educational leaders and policymakers might explore how to replicate these autonomy-supportive features in urban and suburban settings to enhance motivational out-

comes. Finally, teacher training programs should emphasise the development of personal teaching identity and intrinsic goals, especially for pre-service and non-specialist educators.

Limitations and Future Research

This study has several additional constraints that warrant mention. First, although the Ministry's sampling frame was national, participation was voluntary, which indicates that non-response analysis was not possible, so that some selection bias may remain. Second, the SEM covariates explained only a small share of the latent variance, suggesting that unmeasured contextual factors, such as school climate, leadership style, or resource availability, may play a larger role than is captured here. Third, the physical-activity item was a single self-report descriptor; therefore, more objective monitoring (via accelerometry) or a multi-item PA scale would provide more reliable estimates. Fourth, the instrument's external validity requires confirmation, as we did not correlate the new scale with established measures of teacher motivation. Finally, common-method variance is possible because predictors and outcomes were collected in the same survey session. Future work could reduce this risk by combining survey data with administrative records or peer ratings.

CONCLUSION

This study provides compelling empirical evidence in support of a continuum-based, interaction-sensitive model of motivation among physical education teachers. The findings provide a comprehensive understanding of what motivates teachers across different contexts by integrating both intrinsic and extrinsic dimensions into a dynamic motivational index and linking this to demographic and behavioural variables. The results reinforce the value of sustaining intrinsic motivation across the teaching lifespan, particularly among under-supported groups such as classroom teachers and experienced educators. Interventions grounded in the Self-Determination Theory and informed by contextual realities can help preserve and enhance teachers' internal motivation, ultimately improving educational outcomes for both students and the systems they are part of.

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МОТИВАЦИОНИ ПРОФИЛИ НАСТАВНИКА ФИЗИЧКОГ ВАСПИТАЊА У СРБИЈИ: ПЕРСПЕКТИВА ТЕОРИЈЕ САМОДЕТЕРМИНАЦИЈЕ

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Резиме

Разумевање мотивационих процеса код наставника физичког васпитања представља кључни фактор за унапређење квалитета наставе, професионалног благостања наставника и подстицање активног животног стила код ученика. Ослоњена на Теорију самодетерминације, ова студија је истражила како унутрашња и спољашња мотивација делују у интеракцији да би обликовале доминантне мотивационе профиле наставника – амотивисани, спољашње мотивисани, уравнотежени и унутрашње мотивисани. Анализа је обухватила широк спектар демографских и понашајних фактора као што су ниво физичке активности, врста школе, улога наставника, пол и радни стаж.

Резултати су указали да наставници са високом унутрашњом мотивацијом чешће испољавају ентузијазам, посвећеност и креативност, док су они мотивисани углавном

спољашњим факторима склонији изгарању и смањеној педагошкој ефикасности. Истовремено, код многих наставника се јавља уравнотежен мотивациони профил, што указује на могућност успешне интеграције унутрашњих вредности и спољашњих захтева. Амотивисани профил, као најризичнији, може бити повезан је са губитком смисла, професионалне исцрпљености и потенцијалним повлачењем из наставничке улоге.

Ова студија такође истиче да контекстуални услови играју важну улогу у обликовању мотивације. Наставници у руралним срединама и они који су физички активнији су склонији испољавању унутрашње мотивације, што указује на значај подршке, флексибилности и осећаја припадности. Насупрот томе, дужи радни стаж, улога учитеља разредне наставе и урбано окружење често су повезани са нижим нивоима унутрашње мотивације. Полне разлике су маргиналне, али ипак указују на то да жене могу бити осетљивије на контекстуалне баријере у доминантно мушком окружењу као што је школски спорт.

Закључно, резултати ове студије доприносе бољем разумевању сложене структуре мотивације код наставника и пружају основ за креирање интервенција и образовних политика које подржавају унутрашње изворе мотивације, професионалну компетентност и благостање наставника. Истраживање такође указује на потребу за даљим квалитативним и лонгитудиналним студијама које би дубље истражиле развој мотивационих профила у различитим наставним контекстима.