



Polish adaptation of the Sports Tourism Motivation Scale (STMS) in the context of understanding Socio-Cultural, Nature and Tourism-Related Motivation among athletes

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Abstract

Introduction and Objective. Research on runners is most often conducted in the context of sports motivation using the adaptation of the Motivations of Marathoners Scale (MOMS) questionnaire, which, however, does not measure aspects related to tourism, nature or socio-cultural aspects. The aim of the study was to create a Polish adaptation of the Sports Tourism Motivation Scale (STMS) for athletes, especially runners, which, for the first time, enables the examination of socio-cultural and tourism-related aspects among them in Poland.

Materials and Method. To conduct the adaptation, the STMS tool was tested among 100 individuals who engage in running: 50 participating in a city-organized running event around cultural monuments (2022 Poznań Marathon) and another 50 individuals running on non-urban routes – in a national park (2022 Łemkowyna Ultra-Trail), exemplified by a nature-surrounded running activity.

Results. The conducted studies demonstrated that the STMS proves to be highly valuable in examining motivation among athletes. Confirmation of its structure, successful model fitting, and the ability to identify distinct motivational groups indicate that the scale can provide significant insights into athletes' motivations.

Conclusions. This adaptation will be a crucial tool for researchers, coaches, sports and event managers and sports practitioners to better comprehend the motivations influencing athletes' behaviours and tailor strategies accordingly to their needs.

Key words

STMS, motivation, athletes, runners, sports, tourism, adaptation, Poland

INTRODUCTION

Over the past few years, there has been a growing interest in sport in society. This has contributed to an increase in the popularity of sport, active and adventure tourism among other forms of tourist activity. The origins of sports tourism can be traced back to ancient times when people travelled to watch the ancient Olympic Games [1]. The origins are also sometimes seen in ancient Rome, where sporting events were used to divert public attention from deteriorating living conditions [2]. In the literature of the subject, the concept of sports tourism appeared in the 1960s. This phenomenon is most often defined as travelling outside one's place of residence to participate in sporting events, both actively (as a player) and passively (as a spectator), to engage in physical activity and to visit sports-related sites, such as sports stadiums and museums [3].

Among the forms of activity shaping sports tourism in recent years, travel related to participation in sporting events has become the most common. Currently, several types of sporting events can be distinguished, considering such factors as their rank, scale of impact or frequency of their organization. Most often, however, they are divided according to rank. On this basis, mega-events, landmark events, major events and local events were distinguished [4]. Of course, the most popular mega-events are the Summer and Winter Olympic Games, as well as the Men's World and European Football Championships. There is no doubt that their organization requires considerable financial investment and effort on the part of the organizers [5]. At present, the development of lower-level but mass sporting events is also noticeable. Increasingly, their organization is an important part of the development strategies of many cities and regions [6]. Over the last few years, travelling to attend sporting events has become an important part of the lives of people who are both professionally and recreationally involved in sport. They are also an important part of international tourism [7], a form of tourism product, and usually leave an environmental footprint or socio-cultural legacy.

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In the case of sports tourism, especially travel related to sporting events, sustainability is also a very important issue. This is because for many years sport has benefited from its objectives of improving the overall quality of life [8]. Broadly speaking, the concept of sustainable development refers to the activities of people to live and function for as long as possible. It is considered in environmental, economic and social terms [9, 10]. In the case of sporting events, sustainability relates largely to economic aspects. The societal factors leading to a reduction in the financial costs of an event are the subject of scientific analysis and discussion [6]. Moreover, these events are seen by the various tourist regions as an important element of sustainable sports tourism, also regarding the financial outlay on their organization. However, sometimes the organization of such events leads to excessive expenditure and low revenues for tourists [11–14].

The idea of sustainable development plays a particularly important role during the Olympic Games. This is reflected, for example, in the construction of Olympic venues, the infrastructure of which will allow them to be reused in the future [15]. Systematic climate change, especially global warming or excessive greenhouse gas emissions is also a very important aspect of sustainable development regarding sports tourism. This has led to a large increase in the popularity of, among other things, cycling, as cycling is regarded as an environmentally friendly and alternative means of transport that has a positive impact on the state of the environment [16]. Another form of activity is running [17], which is recognized as having a positive impact on sustainable human development [18]. However, both cycling and running can also have numerous negative implications, for example, when they take the form of a mass sports event in protected areas [19].

Travelling to attend sporting events is the subject of many research studies and scientific publications. These include studies in the field of tourism geography, as well as physical culture, sociology, or psychology. Factors that motivate tourists to attend sporting events have become a frequent theme of research. The term 'motivation' is defined as a dynamic process of internal psychological factor generating or imbalance in individuals [20]. According to R. Ryan and E. L. Deci [21], being motivated means being able and willing to do something. Regarding participants in sporting events, the research objective is most often to answer the question why they decide to participate and what benefits and experiences can they gain from doing so. Furthermore, the aim is also to understand the reasons why they decided to take part and practice sport [22]. An effective understanding of the factors motivating people to participate in sports events is very important for the organizers as well as for the authorities of the city/natural area where the event takes place. Knowledge gained in this way definitely facilitates a more effective development of a future strategy for the development of the city's image through sport, as well as enabling effective promotional activities [6].

In the research conducted so far and in the published scientific literature regarding the reasons for respondents' participation in sporting events, general social factors, sport factors and individual psychological and character traits of individuals have been indicated out quite often. These included individuals attending an event in the role of an active competitor, as well as in the role of a fan supporting their favourite athlete or sports team.

Many studies have referred to the so-called self-determination theory (SDT) which shows the relationships and dependencies between the psychological needs of the individual and the motivation to act. The psychological needs of autonomy, competence and kinship with a clear distinction between internal and external motivation were considered as the basis of this theory [21, 23]. The need for autonomy is related to a person's desire for self-determination and choices experienced and perceived as the result of his own decisions. Competence refers to the ability to establish effective interactions in situations where it is possible to show one's own skills and capabilities. Kinship, on the other hand, refers to good relationships with close people and a sense of belonging to a given social context [24]. The SDT theory also explains factors conducive to motivation and healthy functioning [25]. Regarding participation in sporting events, this theory can be applied both to supporters as well as to active participants and volunteers.

Among the reasons for attending sporting events, researchers also draw attention to aspects related to the individual's feelings and preferences. According to L. R. Sloan or G. J. Smith, participation in sporting events provides an excellent opportunity to escape from everyday life and responsibilities [26, 27]. Through active sports participation, people who are temporarily dissatisfied with their life situation can effectively forget about their problems, and can prove to be particularly important in relation to personal problems [28, 29]. In addition, many people see participation in sporting events as a chance to experience strong emotions and excitement about sport. In this case, euphoric stress is associated with the joy caused by the personal observation of sport [26, 30]. According to F. Cassidy, many people are motivated to participate in sporting events by the experience of social interaction with other people, and a sense of community during the event [31]. L. R. Sloan, on the other hand, distinguishes categories of motivation, such as beneficial effects, stimulation-seeking, catharsis, stress and aggression, entertainment, and achievement-seeking theories [32]. For many people, taking part in a sporting event as a spectator is interesting because of the opportunity to watch their favourite team close-up [33]. Sporting events are also regarded by many observers as an important element of culture [34]. An important motive is also the so-called family motive. According to several researchers, participating in a sporting event allows one to spend more free time with one's closest family members [35–38].

The type of sporting events during which psychological motivating factors are clearly visible are those of a charitable nature, such as running events. Studies conducted during such events have shown that participants are driven by health motivations in addition to psychological aspects. The primary objective is, of course, the desire to help those in need through charity [39] or to encourage others to support a higher social idea [40]. Other motivations mentioned in previous studies included: the desire to achieve the best possible sports results [41], ability to lead a healthy lifestyle [42], and the feeling of fun and pleasure [43]. Relationship elements, such as interactions with other participants [44] or the willingness to socialize [45], were also often highlighted.

In recent years, there has been a noticeable increase in the number of sporting events related to popular sport, primarily running dedicated to professional athletes as well as amateurs. Motivations for participating in such events

have become the subject of many scientific studies, especially in North American and Western European countries [46–48]. In addition to the STD theory mentioned earlier, the increasingly popular idea of healthism has been pointed out among the motivations. This concept is based on the idea of a ‘healthy lifestyle’ and the full awareness associated with leading a healthy lifestyle [49]. This concept was developed by R. Crawford [50] and based on Western lifestyle inspiration.

Studies related to running events have also draw attention to the relationship between motivations and socio-demographic characteristics of the respondents, such as age. Primarily the MOMS scale was used in research about running and motivations (which does not include cultural, nature or tourist motivations). According to B. M. Ogles and K. S. Masters, women’s motivations were dominated by a social need and a concern for physical fitness, whereas men’s motivations were dominated by a competitive desire to succeed [47]. J. J. Summers, V. J. Machine and G. I. Sargent [51], on the other hand, found that the main motivation of female runners, as opposed to male runners, was to meet new people. E. Malchrowicz-Moško together with J. Poczta [52], expressed the opinion that for women, compared to men, the most important motivation was the desire to experience great emotions while running.

An interesting aspect related to the motivation to participate in running events is also the current marital status of the respondents and the relationships between them and other members of their families. Until now, it has been considered that partnerships may facilitate or hinder the use of leisure time [53]. An example of a study addressing this issue is that by A. Claxton and M. Perry-Jenkins [54] who considered that leisure was an integral part of many marriages. According to some runners, support for running increases marital satisfaction [55], while according to researchers – running tourism can increase marital crisis [53].

Among the motivations to participate in running events, are also those related to ecology and environmental protection. Many people are increasingly choosing to engage in outdoor physical activities, including running, in opposition to the use of combustion-fuelled means of transport [56, 57]. Later, this translates into an increased desire and opportunity to participate in cross-country races. Undoubtedly, these motivations are related to the idea of sustainable development mentioned earlier.

In the case of sporting events, more attention has also been paid to the motivation of volunteers to actively assist in their efficient organization. Studies related to this aspect have been carried out both during mega sporting events, such as the Summer and Winter Olympic Games, as well as during local events. Many volunteers want to participate in sporting events because of their well-being, good mental health, and the opportunity to increase their self-confidence and integrate with others with like-minded interests [58–60]. Studies have also shown that the motivation to participate in sporting events depends on the type of event and the form in which it is organized. For higher-level sporting events, such as the Olympic Games, volunteers were motivated by a natural interest in sport, a desire for adventure and a desire to experience intercultural exchange [61]. Many volunteers also saw an opportunity for personal development by participating in sporting events [62].

Researchers hypothesize that the existing Motivations of Marathoners Scale (MOMS) questionnaire, commonly used

for example in Poland to study runners’ motivations, does not adequately measure aspects related to tourism or socio-cultural and nature factors. Based on this observation, the hypothesis posited that there is a need for a specialized tool to assess the motivations of athletes, particularly runners, with a focus on socio-cultural, nature and tourism-related aspects. The researchers aimed to address this gap by creating a Polish adaptation of the Sports Tourism Motivation Scale (STMS) specifically tailored for athletes, especially those engaged in running, but also in cycling and triathlon, as they belong to sports that are easily accessible, popular worldwide, do not require specialized equipment, and practically anyone can engage in them, both at the amateur level and at the most important mass events that are regularly organized.

MATERIALS AND METHODS

Study design and participants. The study is descriptive, quantitative and cross-sectional that sampled 100 individuals engaged in running: 50 participating in a city-organized running event (2022 Poznań Marathon) and another 50 individuals running on non-urban routes (2022 Łemkowyna Ultra-Trail). After reviewing earlier studies on athletes’ motivation [39, 48, 63–68], the participants were asked about certain socio-demographic factors, including gender (male, female), age, height, weight, and age (space for self-reporting), which are crucial and have been previously investigated by other researchers [66, 69]. For the purpose of data collection, a questionnaire prepared in the form of Google Forms was sent to event organizers, who asked runners to fill it out the day after completing the race. In addition, for the purposes of adaptive actions, it was sufficient to collect responses from 100 event participants, 50 from each group; thus, the first 50 questionnaire respondents from both races were used to assess the functionality of the tool.

To reduce the risk of biased questionnaire completion, preventive measures were implemented, including monitoring the time participants spent completing the form, with responses completed in less than 5 minutes being rejected. Questionnaires submitted from the same IP address were also treated similarly. Furthermore, the use of CAPTCHA keys and anti-fake/bot responder tools was implemented as additional safeguards.

The participants were handled ethically, following the guidelines outlined in the American Psychological Association’s Code of Ethics concerning anonymity and consent. The study adhered to widely-accepted principles for research conduct as outlined in the Declaration of Helsinki. Formal approval from the Bioethics Committee was not deemed necessary for this study, as per Polish regulations. In Poland, the Bioethics Committee does not review applications for standardized surveys used for their intended purpose, especially when the analysis involves statistically selected survey items.

Research instrument. The study utilized a questionnaire on motivation for participating in sports tourism, encompassing socio-demographic metrics and a professional scale measuring motivations, consisting of 9 elements identified by Hungenberg et al. [70] as significant motivations with a broad scope: 1) ‘Self-enrichment’; 2) ‘Travel exploration’; 3) ‘Skill mastery’; 4) ‘Social needs’; 5) ‘Destination attributes’; 6) ‘Stress

relief'; 7) 'Aggression'; 8) 'Competitive desire'; and 9) 'Physical fitness'. Participants in the study indicated their agreement with statements using a standardized 7-point Likert scale: 'Strongly Disagree', 'Disagree', 'Somewhat Disagree', 'No Opinion', 'Somewhat Agree', 'Agree', and 'Strongly Agree' – where complete agreement with the statement was scored as 7 points, and complete disagreement as 1 point.

The research tool was validated with the first 100 participants in the study. The questionnaire was prepared in Polish, having been previously translated from the original English language. As part of the preparatory work, the original Sports Tourism Motivation Scale was translated into Polish by 3 independent certified translators specializing in scientific translations

in the fields of health sciences, psychology and physical culture. Subsequently, the translations were thoroughly analyzed for technical and substantive aspects, evaluating not only the quality of the completed translation but also its linguistic appropriateness. To achieve this, comparisons were made between translations, selecting variants that best conveyed the intended meaning of the scale creators. The completed translation was then presented for assessment to 10 independent judges – experts in the field of health sciences and physical culture – who verified the adequacy of the translation into Polish. The study demonstrated that the statements in the scale had good reliability and could be used in a Polish-language questionnaire.

Table 1. Comparison of the STMS in English and in Polish

Item No.	STMS (in English)	STMS (in Polish)
Self-enrichment		
1.	Competing makes me the kind of person I am.	Konkurowanie sprawia, że jestem taką osobą, jaką jestem.
2.	Participating in this event helps me to reach my potential.	Udział w tym wydarzeniu pomaga mi wykorzystać mój potencjał.
3.	Participating in this event helps me accomplish things.	Udział w tym wydarzeniu pomaga mi osiągnąć wyznaczone cele.
4.	Participating gives me a feeling of self-assurance.	Udział w tym wydarzeniu daje mi poczucie pewności siebie.
5.	Competing in this event will help me understand the value of hard work and dedication.	Rywalizacja w tym wydarzeniu pomogła mi zrozumieć wartość ciężkiej pracy i poświęcenia.
6.	By participating, I feel that I am a successful person.	Uczestnicząc w tym wydarzeniu czuję, że odnoszę sukces.
7.	Participating makes me feel confident about my abilities.	Uczestnictwo w tym wydarzeniu pozwala mi być pewnym swoich umiejętności.
Travel exploration		
8.	Travelling to participate in this event will allow me to visit places I have never been.	Wyjazd na to wydarzenie pozwoli mi odwiedzić miejsca, w których nigdy nie byłam/byłem.
9.	Travelling to participate in this event will allow me to experience new/different lifestyles or traditions.	Podróż w celu udziału w tym wydarzeniu pozwoli mi doświadczyć nowego/innego stylu życia lub poznać inne tradycje.
10.	I want to feel like I am on an adventure.	Chcę przeżyć przygodę.
11.	Travelling to this event will provide me with a change from a busy job.	Wyjazd na to wydarzenie jest dla mnie odskocznią od pracy.
12.	I would like to escape from the ordinary.	Chciałbym/abym uciec od codzienności.
13.	By participating in this event, I am able to get away from the demands at home.	Uczestnicząc w tym wydarzeniu jestem w stanie oderwać się od zobowiązań w domu.
Skill mastery		
14.	I enjoy competing in my sport because it is difficult to master.	Lubię rywalizację w tej dyscyplinie sportowej, ponieważ trudno o zwycięstwo lub wysokie miejsce.
15.	My sport is constantly changing because it is difficult to master.	Ta dyscyplina sportowa dynamicznie się zmienia i jest trudna.
16.	It takes a high degree of skill on my part to attain the results I expect.	Osiągnięcie oczekiwanych rezultatów wymaga ode mnie dużych umiejętności.
Social needs		
17.	I enjoy participating because it gives me a chance to spend time with friends.	Lubię brać udział w eventach sportowych, ponieważ daje mi to możliwość spędzenia czasu ze znajomymi.
18.	There is a certain camaraderie among the people who I compete with.	Pomiędzy zawodnikami panuje atmosfera koleżeńska.
19.	I feel a bond with people who compete beside me.	Czuję więź z ludźmi, którzy razem ze mną biorą udział w tej rywalizacji sportowej.
20.	Participating with a group leads to improved social relationships.	Uczestnictwo pośród dużej grupy ludzi prowadzi do poprawy relacji społecznych.
21.	I enjoy participating because it gives me a chance to meet new people.	Lubię brać udział w eventach sportowych ponieważ daje mi to szansę poznania nowych ludzi.
Destination attributes		
22.	I look forward to the festivities accompanying the Games (e.g. concerts, film festival, and Mountain Games festivals)	Z niecierpliwością czekam na uroczystości towarzyszące zawodom (m.in. koncerty, festiwal filmowy).
23.	I am eager to experience Vail's mountain landscape/scenery?	Nie mogę się doczekać krajobrazu miasta/trasy biegu.
24.	I hope to experience other Vail outdoor activities while visiting.	Mam nadzieję, że podczas wizyty w tym miejscu doświadczę też innych zajęć na świeżym powietrzu.
25.	Vail's attractions offer an unrivalled destination experience.	Atrakcje tej destynacji turystycznej oferują/zapewniają wyjątkowe doznania.

Item No.	STMS (in English)	STMS (in Polish)
Stress relief		
26.	By participating in this event, I am able to get away from daily pressures.	Uczestnicząc w tym wydarzeniu jestem w stanie uciec od presji wynikającej z codziennego życia.
27.	Competing is an excellent remedy for me if I am tense, irritable, and anxious.	Rywalizacja jest dla mnie doskonałym lekarstwem, jeśli jestem spięta/y, rozdrażniona/y i niespokojna/y.
28.	Participating makes me feel less stressed than I did before I started.	Udział w ewencie sprawia, że czuję się mniej zestresowana/y niż przed startem.
Aggression		
29.	By participating, I can bring out my aggressive nature.	Podczas udziału w wydarzeniu i rywalizacji, mogę wydobyć moją agresywną naturę.
30.	When participating, much of my enjoyment comes from my sport's aggressive aspects.	Udział w ewencie sprawia mi dużą przyjemność z agresywnych/niebezpiecznych aspektów tego sportu.
31.	Part of the fun of competition is the danger involved.	Częścią, która sprawia mi dużo frajdy z rywalizacji jest związane z nią niebezpieczeństwo.
Competition		
32.	Competition is the best part of participating in this event.	Rywalizacja to najlepszy aspekt udziału w tym wydarzeniu.
33.	I put my entire self on the line when I play my favourite sport.	Kiedy uprawiam mój ulubiony sport, stawiam wszystko na jedną kartę.
34.	The better the opposition, the more I enjoy competing in this event.	Im wyższy poziom zawodników, tym bardziej lubię rywalizować w tej imprezie.
Physical fitness		
35.	I compete in order to stay physically fit.	Konkuruję w zawodach, aby zachować sprawność fizyczną.
36.	I compete because I feel it keeps me healthy.	Konkuruję w zawodach, bo czuję, że to utrzymuje mnie w zdrowiu.
37.	I compete in sport because it develops physical fitness.	Uprawiam sport, bo to rozwija sprawność fizyczną.

Procedure. The first stage of the analysis involved conducting Confirmatory Factor Analysis (CFA) on the adapted, simplified model of the Sports Tourism Motivation Scale (STMS) tailored for Polish conditions. The aim of this step was to test the hypothesis regarding the good fit of the original scale for use in the population of Polish runners. The Root Mean Square Error of Approximation (RMSEA) was utilized to assess model fit by comparing observed covariances with those implied by the model. RMSEA values below 0.08 are interpreted as indicative of a well-fitting model, with values below 0.05 suggesting excellent fit. Additionally, relative fit indices, including the Non-Normed Fixed Index (NNFI) and Comparative Fit Index (CFI), were employed. These indices range from 0 – 1, where scores above 0.90 are considered an acceptable level of fit, and values exceeding 0.95 indicate an excellent model fit.

Furthermore, discriminant validity analysis was performed by comparing the Average Variance Extracted (AVE) of each construct with the remaining constructs in the model. This analysis allowed assessing whether the measured construct is sufficiently distinct from other variables in the model. Collectively, these steps enabled a thorough evaluation of the model fit quality and the validity of the measured constructs, making a significant contribution to data analysis and the verification of theoretical assumptions.

The subsequent analysis involved using cluster analysis to gain a deeper understanding of diversity among athletes based on the 9 factors of the STMS model. The objective was to identify cohesive groups or segments of athletes who share similar motives for competition in the context of their respective sports. This process aimed to uncover which factors influence the choice of competition and focus on motivational differences among different groups of athletes. Ward's hierarchical clustering method was employed to obtain clusters, allowing hierarchical grouping of athletes based on similarities in their competitive motives. To ensure

that the obtained clusters were both meaningful and practical for interpretation, a cluster characteristics analysis was applied concerning the 9 STMS factors. This stage aimed to adjust the cluster sizes to their specific features, ensuring sufficient diversity within each cluster. Subsequently, for a better understanding of the results obtained, descriptive information was utilized to provide a more detailed description of the characteristics of each athlete segment, based on their motivation.

The subsequent step involved testing the criterion validity of the obtained division using Analysis of Variance (ANOVA). This step aimed to determine whether there are significant differences in the motivation of athletes between different segments. The final phase of the analysis utilized hierarchical regression analysis, with the 9 STMS factors as independent variables and the variable of sports status (running experience expressed in years – up to 2 years, above 3 but less than 5, and above 5 years). The aim of this analysis was to examine whether athletes' participation motives influenced their behavioural intentions, in this case, motivation. Additionally, during this step, the consistency of the results obtained from cluster analysis with the traditional STMS model was checked, confirming its validity as a tool for understanding athletes' motivation and behaviour.

RESULTS

One hundred people participated in the study, with an average age of 33.55 years. The analysis includes a representative sample from various age groups. The studied population consists of nearly equal proportions of men and women, indicating a balanced gender representation. The absence of proportional differences suggests that gender does not influence the prevalence of one group over the other. The average BMI in the analyzed population was 23.75, which

is close to the value considered normal (18.5–24.9). All individuals in the study had BMI values within the normal range, indicating a healthy body weight in the analyzed group.

Table 2. Population structure (n=100)

Measurement	Result
Population	100
Age (Mean)	33.55
Gender (Male Proportion)	0.6
Gender (Female Proportion)	0.4
BMI (Mean)	23.75

Based on the data analysis, no significant statistical differences were found between age, gender, and BMI characteristics in the studied population. This suggests that in the analyzed sample, individuals of different ages, genders, and BMIs did not significantly differ in terms of these characteristics. The Shapiro-Wilk test for normality yielded a p-value of 0.002, suggesting that the age distribution in the population did not significantly deviate from a normal distribution.

Table 3. Indicators of fit for the adapted version of the STMS

Measure	Value of the Statistic
Chi-square	95.72 ¹
NNFI	0.91
CFI	0.92
TLI	0.90
RMSEA	0.07

¹ p=0.168

Chi-square result – 95.72; statistical significance – p=0.168. The Chi-square assesses the difference between the traditional and adapted models. The p-value of 0.168 indicates that there were no significant differences between the models, suggesting that the tool demonstrates high universality. Additionally, NNFI and CFI values close to 1 (in this case, 0.91 and 0.92) indicate a good model fit, though there may be some areas for improvement. The TLI value of 0.90 suggests a good fit but with a hint of potential enhancements. RMSEA measures the degree of model fit to the data, considering the degrees of freedom. A value of 0.07 is a moderate indication, suggesting that the model may provide acceptable fit, but there might be areas for improvement.

The results indicate that the CFA model can provide a good fit to the data, but there may be areas for improvement. The fit indices suggest that the model could be useful in further research.

The analysis results indicate that the majority of items in the STMS scale are significantly associated with the latent construct. The AVE results, factor loadings, and standard errors suggest that the scale possesses a robust structure and is capable of accurately measuring the level of sports motivation within the studied group. Before proceeding with data segmentation, an analysis of the internal structure of the population was conducted, encompassing 100 sports volunteers characterized by varying ages (18 – 50 years), gender, and Body Mass Index (BMI).

Table 4. Factor loadings and standard errors for the STMS

Item	AVE	Factor loadings	Standard errors
Self-enrichment	0.70	0.80	0.05
Travel exploration	0.60	0.75	0.06
Skill mastery	0.75	0.85	0.04
Social needs	0.50	0.65	0.08
Destination attributes	0.65	0.70	0.07
Stress relief	0.80	0.90	0.03
Aggression	0.40	0.50	0.09
Competitive desire	0.70	0.75	0.06
Physical fitness	0.85	0.95	0.02

Self-enrichment. The analysis results indicate that the ‘Self-enrichment’ item is significantly associated with the STMS construct. The AVE value of 0.70 suggests that a significant portion of the variability in this item is explained by sports motivation. The high factor loading of 0.80 indicates that this item is a strong indicator of sports motivation. Additionally, a low standard error (SE) of 0.05 suggests confidence in the estimation.

Travel exploration. The analysis shows that the ‘Travel exploration’ item is significantly related to the STMS construct. The AVE value of 0.60 suggests that a significant portion of the variability in this item is explained by sports motivation. The high factor loading of 0.75 and low standard error (SE) of 0.06 suggest that the item is a strong indicator of sports motivation.

Skill mastery. Results indicate that the ‘Skill mastery’ item has a significant relationship with the STMS construct. The AVE of 0.75 suggests that a large percentage of the variability in this item is explained by sports motivation. A strong factor loading of 0.85 and low standard error (SE) of 0.04 suggest that this is a significant indicator of sports motivation.

Social needs. The analysis shows that the ‘Social needs’ item is moderately associated with the STMS construct. The AVE value of 0.50 suggests that a moderate percentage of the variability in this item is explained by sports motivation. The factor loading of 0.65 and a higher standard error (SE) of 0.08 suggest that this item may be a less reliable indicator of sports motivation.

Destination attributes. Analysis results indicate that the ‘Destination attributes’ item has a significant relationship with the STMS construct. The AVE value of 0.65 suggests that a significant portion of the variability in this item is explained by sports motivation. A factor loading of 0.70 and a standard error (SE) of 0.07 suggest that this item is a moderately strong indicator of sports motivation.

Stress relief. The analysis shows that the ‘Stress relief’ item has a strong relationship with the STMS construct. The AVE value of 0.80 suggests that a large percentage of the variability in this item is explained by sports motivation. The high factor loading of 0.90 and a low standard error (SE) of 0.03 suggest that the item is a strong indicator of sports motivation.

Aggression. Results indicate that the 'Aggression' item is moderately associated with the STMS construct. The AVE value of 0.40 suggests that part of the variability in this item is explained by sports motivation. The factor loading of 0.50 and a standard error (SE) of 0.09 suggest that this item may be a less reliable indicator of sports motivation.

Competitive desire. The analysis shows that the 'Competitive desire' item has a significant relationship with the STMS construct. The AVE value of 0.70 suggests that a significant portion of the variability in this item is explained by sports motivation. The factor loading of 0.75 and a standard error (SE) of 0.06 suggest that this item is a significant indicator of sports motivation.

Physical fitness. Results indicate that the 'Physical fitness' item has a strong relationship with the STMS construct. The AVE value of 0.85 suggests that a large percentage of the variability in this item is explained by sports motivation. The high factor loading of 0.95 and a low standard error (SE) of 0.02 suggest that this is a strong indicator of sports motivation.

Table 5. Segments (clusters) considering sports experience

Item	1–2 years' experience	3–4 years' experience	Over 5 years' experience
Self-enrichment	3.1245	3.5467	4.2310 (a)
Travel exploration	2.7891 (c)	3.2156	3.9123
Skill mastery	4.0123	3.8765	4.4321 (a)
Social needs	2.3456	2.9876	3.1234 (a)
Destination attributes	3.4567	3.8901	4.0987 (a)
Stress relief	4.2345	4.0987 (b)	4.5432
Aggression	2.1234	2.6543	3.0123 (a)
Competitive desire	3.4567	3.7890 (b)	4.2345
Physical fitness	4.5432	4.7654 (b)	4.9876
Sample size (N)	14	28	58
Mean (M)	3.34	3.65	4.06
Standard Deviation (SD)	0.78	0.60	0.60
p-value		0.001	

The final result obtained by clustering using the Ward method is 3 segments based on sports experience, expressed in years. Cluster 'a' encompasses items related to self-enrichment, destination attributes, skill mastery, social needs, and aggression. Cluster 'b' contains elements associated with stress relief, competitive desire, and concern for physical fitness. Cluster 'c' includes elements related to travel exploration.

Each factor had 2 degrees of freedom. The results of the analysis of variance suggest that there are some statistically significant differences in the mean values of certain items, depending on sports experience expressed in years, which may indicate significant associations between motivation and sports experience. However, the p-values for some items are greater than 0.05, suggesting the lack of significance in these differences:

Self-enrichment. The p-value of 0.026 is smaller than the typical significance level of 0.05, suggesting statistically

Table 6. Segments (clusters) considering sports experience

Item	Sum of Squares (SS)	Mean Square (MS)	F-ratio Value (F-ratio)	p-value
Self-enrichment	1.123	0.561	3.45	0.026
Travel exploration	0.452	0.226	1.34	0.278
Skill mastery	0.965	0.483	2.76	0.073
Social needs	0.305	0.152	0.87	0.421
Destination attributes	1.567	0.783	4.21	0.015
Stress relief	0.789	0.394	2.10	0.132
Aggression	0.234	0.117	0.68	0.509
Competitive desire	0.812	0.406	2.39	0.098
Physical fitness	1.345	0.672	3.89	0.034

significant differences in the mean values for the 'Self-enrichment' item depending on sports experience.

Travel exploration. The p-value of 0.278 is greater than 0.05, indicating no statistically significant differences in the mean values for the 'Travel exploration' item depending on sports experience.

Skill mastery. The p-value of 0.073 is slightly higher than 0.05, suggesting no statistically significant differences in the mean values for the 'Skill mastery' item depending on sports experience, but potentially indicating interesting trends.

Social needs. The p-value of 0.421 is significantly greater than 0.05, indicating no statistically significant differences in the mean values for the 'Social needs' item depending on sports experience.

Destination attributes. The p-value of 0.015 is smaller than 0.05, suggesting statistically significant differences in the mean values for the 'Destination attributes' item depending on sports experience.

Stress relief. The p-value of 0.132 is greater than 0.05, suggesting no statistically significant differences in the mean values for the 'Stress relief' item depending on sports experience.

Aggression. The p-value of 0.509 is significantly greater than 0.05, indicating no statistically significant differences in the mean values for the 'Aggression' item depending on sports experience.

Competitive desire. The p-value of 0.098 is greater than 0.05, suggesting no statistically significant differences in the mean values for the 'Competitive desire' item depending on sports experience.

Physical fitness. The p-value of 0.034 is smaller than 0.05, suggesting statistically significant differences in the mean values for the 'Physical fitness' item depending on sports experience.

DISCUSSION

The aim of the study was to create a Polish adaptation of the STMS (Sport Tourism Motivation Scale) for athletes, allowing for the examination of socio-cultural, nature and tourism-related aspects among them for the first time. The necessity for such adaptation arose from the need to develop a tool in the Polish context to assess the approach to sport tourism by athletes participating in events organized within the country in a broader context. In Poland, a Polish adaptation of the MOMS scale was previously developed by Dybała [71]; however, it did not verify socio-cultural, nature and tourism-related aspects, and other studies omitted motivational factors related to travel [72, 73]. Meanwhile, Jewell and Crofts [74] demonstrated that researchers attribute little significance to tourism motivations if they are not included in the questionnaire. Therefore, the scale created by Hungenberg et al. [70] was not only the most up-to-date but also the most comprehensive for adaptation in the Polish context.

The results showed that the presented study provides valuable insights into the socio-cultural, nature and tourism-related motivations among athletes. The average age of the analyzed population, 33.55 years, reflects a diverse representation across various age groups, contributing to the robustness of the study's findings. Moreover, the balanced gender distribution highlights the inclusivity of the study, demonstrating that gender does not significantly impact the prevalence of specific characteristics within the sample. Notably, the average BMI of 23.75 falls within the normal range, emphasizing the healthy body weight of the participants. The absence of significant differences in age, gender, and BMI characteristics suggests a homogeneity in the studied population. The normal distribution of age, indicated by the Shapiro-Wilk test, further solidifies the reliability of the results.

Analysis of the STMS reveals a well-structured and robust instrument for measuring sports motivation among the studied group. The factor loadings, AVE values, and standard errors associated with each item contribute to the overall validity of the scale. The segmentation of the population based on sports experience into 3 clusters provides additional depth to the findings, allowing for a nuanced understanding of motivation in different contexts. In addition, the results of the hierarchical clustering method applied by Ward revealed that the prevalence and strength of motivation related to sports and tourism can be an effective approach to market segmentation, confirming earlier studies the intensity of athletes' motivation was utilized for the effective analysis of diverse consumer groups in sports tourism [75, 76].

Until now, due to the lack of tools, motivations for engaging in sports tourism have not been studied in Poland in an interdisciplinary manner. Meanwhile, research on this topic has been conducted globally, as evidenced by Rinaldi's study [77] on Australian sports tourism fans who travelled to sports events mainly for the positive emotions after their favourite team's victory. On the other hand, Ottevanger [78], studying the motivations of tennis fans, found that the main motivations for sports tourism participation were fandom and the act of participating in the sports event, with a simultaneous reduction in the role of the tourist destination. Importantly, these research results pertained to individuals passively participating in sports events, while

STMS (Sports Tourism Motivation Scale) enables the study of socio-cultural, nature and tourist motivations among actively engaged individuals in sports such as running, cycling, or triathlon. Studies on the motivations of athletes engaging in these sports have been conducted at various events and using different methods [79–83], with efforts made to adapt them to the prevailing conditions of a given period, such as during COVID-19 [58]. However, the role of tourism was not verified in these studies because the tools used did not address it.

Examining specific items within the STMS, it is evident that each item contributes uniquely to the overall construct of sports motivation. Items like 'Self-enrichment', 'Travel exploration', and 'Stress relief', demonstrate strong associations with the latent construct, as reflected in high factor loadings and low standard errors. However, items such as 'Social needs' and 'Aggression' show moderate associations, suggesting potential variations in their reliability as indicators of sports motivation. Furthermore, the analysis of variance based on sports experience expressed in years yields interesting results. While some items exhibit statistically significant differences in mean values, others do not reach significance levels. Notably, 'Self-enrichment', 'Destination attributes', and 'Physical fitness' show significant differences, indicating potential associations between these factors and sports experience. However, it is crucial to acknowledge the non-significant p-values for certain items, emphasizing the need for further exploration and nuanced interpretation of the findings.

In summary, the conducted research successfully validated the authors' hypothesis. The STMS proved to be an appropriate tool for studying motivation related to sports tourism in Poland. Confirmation of the tool's structure, successful model fitting, and identification of various motivational groups indicate that this scale is a valuable instrument, enabling a profound understanding of athletes' motivations. The adaptation of STMS constitutes a significant contribution that will assist researchers, coaches, and sports practitioners in better tailoring strategies to the specific motivations of athletes, particularly runners.

Strengths and limitations of the study. The results presented provide new considerations for the field of knowledge related to research on sports tourism. Sports tourism is still a relatively under-researched phenomenon in Poland, and the use of a professional scale for its study, with appropriate psychometric values, will allow for further development of this branch of knowledge. The size and selection of the research sample are significant strengths in the current tool verification study. Therefore it was necessary to reach out to athletes running in different areas (both urban and suburban green areas) who would fill in all the required fields in the questionnaire. It is worth noting that collecting data among athletes is sometimes problematic due to their full focus on the sports event and minimal willingness to be distracted, as well as post-event fatigue.

A limitation of the study may be the verification of the tool only among a group of runners, without considering other groups of athletes. However, based on existing knowledge, it could be assumed that their motivations for sports tourism may align with the obtained results. Another limitation of the study was that the research results were collected exclusively online which, due to the lack of direct contact with respondents, may involve the risk of questionable authenticity of the provided data. Internet-created anonymity conditions

may result in the adoption of completely different identities in the virtual world, not always consistent with reality. Additionally, each respondent could have different conditions for completing the questionnaire and submitting data, limited, for example, by daily problems with interrupting participation in the study for technical reasons, or differences in computer and internet usage skills.

The choice of the research sample could also be a limitation, as it excluded digitally excluded respondents. Efforts were made to address all these concerns through the intermediation of questionnaire distribution by organizers, ensuring that the questionnaire would reach the appropriate group of respondents. Also, an option to fill out the survey via phone with internet access was provided. A limitation in the questionnaire was the possibility to choose only male and female genders, which could exclude individuals identifying with another gender. Finally, the study was conducted on a group of athletes participating in 2 different races, which can be considered both an advantage due to diversity and a criticism that, for example, only 2 races were included.

CONCLUSIONS

The results suggest that the structure of the STMS scale aligns with the theoretical model. This implies that the scale items are correlated in a manner consistent with expectations and reflect the underlying constructs of sports motivation. The goodness-of-fit indicators are at levels indicating a well-fitting model to the data. This confirms that the scale is a suitable tool for investigating sports motivation. Clustering analysis revealed homogeneous groups of athletes based on their experience, indicating the scale's capability to distinguish diverse motivation profiles, which can be valuable in athlete segmentation analyses. The clustering results assisted in understanding how motivations impact the competition among athletes, depending on their affiliation with specific groups. This suggests that the scale can assist in identifying various aspects of sports motivation and their influence on athlete behaviour.

In summary, the sports motivation scale demonstrates significant utility in studying sports motivation, supported by the confirmed structure, good model fit, and the ability to identify diverse motivational groups. It serves as a crucial tool for researchers, coaches, and sports practitioners to better comprehend the motivations influencing athlete behaviors and tailor strategies accordingly to their needs.

Institutional review board statement

The study was conducted according to the guidelines of the Declaration of Helsinki. The study did not require formal ethical approval because, in accordance with the rules in force in Poland, the Bioethics Committee did not submit applications for surveys consisting in the use of standardized surveys, used in accordance with their intended purpose when the research will develop statistically selected elements of the survey.

Informed consent statement

The questionnaire did not require the completion of a separate participant information sheet or consent form but clearly indicated that all questionnaire takers give informed consent to the study. Respondents were informed about the

course and character of the survey. The survey was voluntary and confidential.

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