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Sustainability in Participatory Sports Events: The Development of a Research Instrument and Empirical Insights

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Abstract: The United Nations (UN) considers sports as an important enabler of sustainable development. The popular and fast-growing Participatory Sports Event (PSE) sector can play an important role in this regard, however, research that measures and reports sustainability in PSEs is scarce. Therefore, the aim of this paper was to construct and validate a research instrument based on the UN's sustainable development goals, and to examine sustainability in PSEs. To this end, an online survey was administered among a representative sample of 303 PSE organisers, located in Flanders, Belgium. A confirmatory factor analysis affirmed the social, economic and environmental dimensions of the instrument and provided evidence for its validity and reliability. The results reveal significant discrepancies between the three dimensions, with a noticeable lower score for environmental sustainability compared to social and economic sustainability. Furthermore, challenges are highlighted in the field of the civil society sector and in walking sports events. The findings also indicate that large-sized events are more likely to be sustainable. The current study can act as a foundation for future research on sustainability in PSEs and can assist PSE organisers and policymakers to increase the sustainability-related performance of the sector.

Keywords: PSEs; sustainable development goals; SDGs; social sustainability; economic sustainability; environmental sustainability; sports event management; Flanders; Belgium

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1. Introduction

Due to its global reach and universal language, sports can be seen as a powerful tool to unify people and generate common objectives. Therefore, the awareness that sports might be a valuable contributor to a more sustainable future has been steadily increasing [1]. An important milestone in this regard was the publication of the United Nations 2030 Agenda for Sustainable Development, in which sports is recognised as an important enabler of sustainability [2]. The Sustainable Development Goals (SDGs) presented in this resolution aim at creating a more environmentally sustainable, socially equitable and economically efficient society. While the SDGs are considered to be a promising framework towards a sustainable future, research that connects the SDGs to the sports sector is lacking [3]. Nevertheless, an increase in consciousness and efforts of sports organisations to embed sustainability in their work and actions is noticeable [4,5]. Yet, the availability of an empirically underpinned assessment tool will be an important step for the sector to enhance its performance in terms of sustainability. In the sports event sector, more precisely regarding Participatory Sports Events (PSEs), adequate literature is particularly scarce [6–9].

PSEs can be defined as events that promote "participation and engagement rather than the significance of the sporting outcome" [10] (p. 20) and are "open to all" [11] (p. 8) or

"open-entry events" [12] (p. 149). According to the classification suggested by Gratton and Taylor (2000), PSEs can be categorised as non-mega events [13], whereas large spectator sports events, like the Olympic Games, the Football World Cup, the Commonwealth Games, and so forth can be categorised as mega or major events since they attract many non-local spectators and their focus is on the competition of elite athletes [8,9,14]. Even though PSEs are often smaller in scale compared to their mega and major event counterparts, they are organised much more frequently [9], and research indicates that their popularity has increased considerably in recent years [15–19]. The outreach and impact of this fast-growing sector should, therefore, not be underestimated. However, PSE managers are nowadays lacking crucial knowledge about the sustainability-related performance of their events, and, thus, challenges need to be highlighted in the sector to improve in this regard.

1.1. Sustainability and the Sustainable Development Goals

Whereas the link between sports and sustainability is rather recent, the term "sustainability" as such has been used for centuries [20]. The concept gained popularity in the early 1970s as a result of the increasing tension between economic growth and environmental conservation [21]. To raise consciousness and search for solutions, the United Nations (UN) organised the first International Conference on the Human Environment, held in Stockholm, Sweden in 1972 [22]. However, no concrete actions followed, which led to the foundation of the World Commission on Environment and Development (WCED). The WCED was a group of experts chaired by the Norwegian Prime Minister Gro Harlem Brundtland, with the main task of developing an international long-term environmental strategy [23]. The commission resulted in the report *Our Common Future*, also known as *The Brundtland Report*, which states that sustainable development is the key to creating economic growth and social equity without compromising the environment [23]. The report defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" [23] (p. 43). Although the description has been criticised as vague and ambiguous [24,25], it is still the most widely used and best-known definition [21]. The commission was the first to put emphasis on three aspects of sustainability (i.e., social, economic and environmental), which remained central in the development and implementation of the concept [26].

The work of Elkington (1998) marked another important milestone for the concept [27]. Although it is questioned whether Elkington was the original creator of the framework, his popular book *Cannibals With Forks* cemented the so-called Triple Bottom Line (TBL) framework into the 21st century [28,29]. The TBL framework defines and encompasses social, economic and environmental "aspects", "pillars" or "dimensions", and emphasises that their interconnection and complementarity form the keystones of sustainability [29]. Throughout the years, the TBL framework has become widely acknowledged and forms the foundation of several international certification programmes like the Leadership in Energy and Environmental Design (LEED), the Dow Jones Sustainability Indices (DJSI) and the Sustainable Business Achievement Rating System (SBAR) [30]. Furthermore, the TBL framework and its three dimensions have an important role to play in the UN's battle against inequality and environmental degradation, as they form the foundation of the Sustainable Development Goals (SDGs) [2].

The seventeen SDGs were established and presented in 2015 by the members of the United Nations General Assembly, as a follow-up for the Millennium Development Goals (MDGs), which ran from 2001 to 2015 [31]. While the MDGs mainly focused on socio-economic problems in the Global South, the SDGs are targeting all three dimensions of sustainability with an explicit focus on underconsumption in the Global South and overconsumption in the Global North [1]. Since the aim of the SDGs is to set a wide range of objectives based on the three sustainability dimensions (i.e., social, economic and environmental) [2], it is but a small step to link the SDGs to the TBL framework. Costanza and colleagues (2016) contributed to this idea by classifying the seventeen SDGs

according to the three dimensions described in the TBL framework, which was later on further empirically underpinned by Dalampira and Nastis (2019) [26,32].

1.2. The Sustainable Development Goals and Participatory Sports Events

The publication of the SDGs provided a solid policy framework and supporting instrument to enhance global sustainability. Furthermore, it marked an important milestone for sports, since it was the first time that sports were recognised as an important enabler of sustainable development by an international policy [3]. According to Swatuk (2020), sports can make the most meaningful contribution through SDG 12, representing "responsible consumption and production" [1]. However, international sports organisations and researchers agree that sports offer an immediate link with a vast majority of the SDGs [33,34]. Nonetheless, to this day, empirical academic research that analyses the relationship between sports and the SDGs is lacking [3]. The literature, however, indicates that sports, and in particular, sports events, can have a significant social, economic and environmental impact [35–38]. Environmental sustainability especially seems to be often taken for granted in managerial contexts [4]. The European Commission addressed the matter in 2007 and declared that sports event organisers should promote environmentally sound management in order to make events more sustainable [39]. Throughout time, more environmental guidelines and standards have emerged, with the most recent advancement being the publication of the United Nations Sports for Climate Action Framework in 2017 [40]. However, Sotiriadou and Hill (2015) state that progress in the field remains slow and that further research is needed to encourage changes in the behaviour of sports event organisers [5]. Swatuk (2020) also argues that sports organisations are nowadays satisfied with playing a secondary role in this regard, for instance, by promoting and raising awareness instead of acting sustainably and taking manifest initiatives [1]. One of the aspects that perpetuates this problem is a lack of the measuring, evaluating and reporting of sustainable initiatives in the sector [37]. Having an adequate measurement tool to assess sustainability and detect changes throughout time will be an important step towards (more) sustainable sports events.

Nevertheless, consciousness for sustainability in sports events is gradually advancing [4], being substantially influenced by international sports organisations. In 2006, for example, the International Olympic Committee published a guide called *Sport, Environment and Sustainable Development* [33]. Ever since then, sustainability has slowly found its way into the business models and strategic planning of international sports organisations with corresponding sustainability standards for their mega-events [33,41,42]. Accordingly, an increasing number of international sports events seems to be classifiable under the label "green games" or "green cup", as they strive to be socially equitable and environmentally sustainable. As a consequence, a vast majority of the available literature focuses on mega or major sports events, whereas research on smaller sports events, among them PSEs, is limited [6–9]. Furthermore, the majority of the publications that examine sustainability in PSEs approaches the concept from a particular sustainability dimension, with most research focusing on social sustainability [8,9,14,43–45] or economic sustainability [9,35,46,47]. When environmental sustainability is addressed, it focuses on spectator sports events [48–51] or uses lengthy and analytical methods to map the environmental impact [37,52]. The research of Gibson and colleagues (2012) is one of the few studies that empirically covers all three dimensions (i.e., social, economic and environmental) from a tourism development point of view. While the paper addresses some interesting aspects, the authors themselves suggest the development of a more standardised instrument to facilitate comparisons across events [53].

Thus, to begin with, a standardised instrument to measure sustainability is needed. Moreover, it is of importance that the PSE sector has empirically underpinned guidelines and insights into which event characteristics might determine their performance. To date, research that provides this information is very scarce. As a result, PSE organisers are lacking important knowledge about the sector, which normally would enable them to

make adequate decisions and implement relevant improvements. Furthermore, this type of information could support policymakers towards well-targeted supportive measurements when needed. For example, non-sports-related research has indicated that public organisations have a higher likelihood of acting sustainable [54]. Scholars have also found evidence that the size of an organisation matters in terms of sustainable behaviour [54,55]. It can, therefore, be assumed that larger PSE organisations would perform better on sustainability. When these and other important characteristics are examined in a sports event-related context, the sector can profit to a large extent. More precisely, such research can highlight challenges, serve as a benchmark for follow-up studies and unlock the possibility to gather specific knowledge and transfer applicable best practice examples from other sectors.

To this end, this paper will contribute to the current academic and practical knowledge of sustainability in PSEs by addressing whether or not it is possible to construct and validate a research instrument based on the SDGs. This objective will respond to the need to bridge the gap between sports and the SDGs and will provide a measurement tool to analyse sustainability in PSEs. Subsequently, the study examined two secondary research questions, with the first sub-question addressing the current performance level of sustainability in PSEs, focusing on the three dimensions of sustainability (i.e., social, economic and environmental). The second sub-question examined whether or not differences in sustainable performance can be detected when looking at typical characteristics of PSEs. More precisely, it was examined if the variables "profit sector" (i.e., civil society sector, commercial sector and public sector), "sports" (i.e., cycling, running and walking), "size of the event" and "number of event editions organised" have an influence on sustainability.

In the material and methods section of this paper, the data collection, research instrument, sample description and data analyses are presented. The result section addresses the constructed research instrument and presents the results regarding the sustainability of Flemish PSEs in general and with regard to the event characteristics in particular. Thereafter, each research question is subsequently discussed, and a final conclusion is presented.

2. Materials and Methods

2.1. Data Collection and Research Instrument

In order to gather data on the sports event sector, the Flemish Sports Event Panel (FSEP) was composed [56,57]. The FSEP encompasses 833 sports events located in Flanders, the northern, Dutch-speaking part of Belgium. The panel covers different sports, but this study focused solely on the three most popular Flemish sports, that is, cycling, running and walking [58], accounting for a total number of 715 events in the panel.

To be eligible for inclusion in the FSEP, two main requirements were proposed. First, the events had to comply with the criteria of a PSE, that is, the event had to be accessible to the general public [10–12]. Second, the contact details of the event organisers needed to be publicly available on the internet, so the organisers could be invited to participate in the study. Furthermore, when selecting the events, it was ensured that the database was representative of all three sports (cycling, running and walking), the timing of the event, that is, the first half of the year (January through June) and the second half of the year (July through December) and profit sector. Concerning the latter, three main profit sectors can be distinguished in Flanders [59]. First, the civil society sector, which includes voluntary associations, such as sports clubs, that aim at generating social profit. Second, the commercial sector, which encompasses companies and firms that primarily pursue economic profit, and third, the public sector, including public administrations dealing with sports, such as local sports authorities.

The academic literature was thoroughly scrutinised for an instrument to measure sustainability in PSEs, however, no applicable instrument could be found. Therefore, a research instrument was constructed based on the SDGs formulated in the report *Transforming our World: the 2030 Agenda for Sustainable Development* (Table 1) [2]. The aim of the instrument was to get a consistent sustainability score without using a complex questionnaire. Therefore, one SDG is represented by one item in the instrument. The item

in the instrument reflects the respective SDG as closely as possible by using the most applicable corresponding target for a PSE. The items were translated into Dutch so that the instrument was understandable for all respondents. Originally, the SDG framework consists of 17 different goals that represent sustainability. After consideration, however, 1 goal, SDG 4, representing "quality education", was left out of the instrument since it was not applicable to the sector of sports events. The other 16 goals were, in consolation with multiple researchers, converted into items applicable to PSEs and measured on a five-point Likert scale, ranging from strongly disagree to strongly agree. To divide the SDGs into the social, economic and environmental dimensions, the structure proposed by Dalampira and Nastis (2019) was followed, in which four expert groups categorised the 17 SDGs according to the three dimensions (i.e., social, economic and environmental) [26].

Unfortunately, the COVID-19 pandemic was spreading around the world by the time the survey was composed. Among many other things, the COVID-19 restrictions implemented by the Belgian government on 18 March 2020 prohibited the organisation of (non-elite sports) events until further notice. However, since the questions included in the survey focused on the last edition of the event before the restrictions, it was decided to proceed with the inquiry. A test run of the survey was performed on a content and technical level, and on 26 May 2020, the sports event organisers included in the FSEP were invited via email to participate in the study. Three reminders were sent out to encourage the organisers to complete the survey and strive for a representative response. The data collection was closed on 13 July 2020 and resulted in 483 (partially) completed surveys for the three sports considered in this study, which accounts for a response rate of 68%. After checking for completeness of the variables, 303 events were included for further analyses.

2.2. Sample Description

The final sample of 303 PSEs was examined for representativeness regarding the three abovementioned criteria (i.e., sports, timing and profit sector) and proved to adequately reflect the current PSE population in Flanders ($\chi^2 = 3.85$; NS). The majority of the people who filled in the survey as respondents of their organisation were board members (84%). More precisely, in 45% of the cases, the chair of the board filled in the survey, in 30% of the cases, the secretary general did, and in 9% of the cases, another member of the board did. The remaining 16% of the respondents identified themselves as managers of the event. It can be assumed that the respondents were sufficiently experienced and adequately positioned to fill in the questionnaire on behalf of their organisation, with an average tenure level of 18.8 years (SD = 12.1). In the sample, 117 of the sports events (38.6%) were cycling events, 70 (23.1%) were running events and 116 (38.3%) were walking events. There is almost an even distribution noticeable with regard to the timing of the events (46.5% were in the first half of the year, 53.5% in the second half of the year). Among the 303 events, 279 (92.1%) were organised by a civil society organisation, 10 (3.3%) by a commercial organisation and 14 (4.6%) by an organisation in the public sector. On average, the events in the sample had 1708 participants (SD = 6298, range = 12 to 36,500). To operationalise the variables "size" and "number of editions organised", the sample was divided into three equal thirds. Events with fewer than 538 participants were considered small-sized events, whereas events with a participant number between 538 and 1100 were defined as medium-sized events, and events with more than 1100 participants were defined as large-sized events. Further, the average number of event editions organised was 20 (SD = 15, range = 1 to 120). The lowest third of the sample are events that have been organised with fewer than 10 editions, and the upper third in the sample are events that have been organised with more than 25 editions.

2.3. Data Analyses

A confirmatory factor analysis (CFA) was performed to assess the construct of the research instrument and, therefore, to address the main research question. The CFA was conducted with the AMOS 26 Software, which allows for the possibility of examining

the fit of the construct and whether or not the different items load under the expected sustainability dimension (i.e., social, economic or environmental). To evaluate the fit of the construct, the following indicators suggested by Hu and Bentler (1999) were considered: the Chi-squared test divided by the degrees of freedom (χ^2/df), the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI) and the Root Mean Square Error of Approximation (RMSEA) [60]. The cut-off values supported by Marsh and colleagues (2004) were applied to assess whether the indicators show an acceptable fit; $\chi^2/df < 5$, CFI > 0.90, TLI > 0.90, RMSEA < 0.08 [61]. Thereafter, the data were imported into SPSS Statistics 27, and the Cronbach's alpha coefficients of the instrument and its three dimensions were computed to assess the reliability. Since the dependent variable was normally distributed, further analyses were conducted using parametric statistics. Thus, to analyse significant differences between the three sustainability dimensions and, therefore, answer the first sub-question, a paired sample *t*-test was performed. The second sub-question was addressed by performing one-way analysis of variance (ANOVA) tests with Bonferroni post hoc analyses to detect whether or not significant differences exist between the profit sectors, sports, event sizes and the number of event editions organised.

3. Results

3.1. Construct of a Research Instrument to Measure Sustainable Performance

To examine the main research question, a CFA was performed, and the instrument and its three-dimension structure were assessed. The indexes indicate an acceptable fit for the values $\chi^2/df = 2.56$, CFI = 0.92 and RMSEA = 0.07, and an almost fit for TLI = 0.90 [61]. Furthermore, all items loaded significantly on their respective dimension ($p < 0.001$), with sustainability in general as a second-order latent variable. There were 13 out of 16 items that had a medium (0.5–0.7) to high (>0.7) factor loading, and 2 extra items had a factor loading very close to medium [62]. The standardised factor loadings are presented in Table 1. Thereafter, the reliability of the instrument was determined and resulted in a Cronbach's alpha of 0.89 for sustainability in general and an alpha value of 0.72 for social sustainability, 0.68 for economic sustainability and 0.82 for environmental sustainability (Table 1). The values are very close to or exceed the recommendations made by Bernstein and Nunnally (1994), who suggest that values from 0.70–0.79 can be accepted as an "adequate" level of reliability, and values from 0.80 and up can be accepted as a "good" level [63]. Furthermore, the alpha value does not increase when (an) item(s) is/are deleted. To conclude, the CFA and the Cronbach's alpha values confirm the fit of the constructed instrument that is based on the SDGs and, therefore, underscore its validity and reliability.

Table 1. The 16-item instrument to measure the sustainability of Participatory Sports Events with standardised factor loadings of confirmatory factor analysis and Cronbach's alpha values.

Sustainable Development Goals		Item Description	SoS	EcS	EnS	α
Number	Goal					
Sustainability in general						0.89
Social Sustainability (SoS)						0.72
2.	Zero hunger	Our organisation ensures diverse food and drink opportunities at the event	0.56			
5.	Gender equality	Our organisation ensures gender equality of the participants at the event	0.49			
8.	Decent work and economic growth	Our organisation ensures productive employment and decent work at the event	0.48			
10.	Reduce inequalities	Our organisation ensures an equal chance of participation at the event, irrespective of age, ethnicity, religion, economic or other status	0.64			
16.	Peace, justice and strong institutions	Our organisation ensures peace and security at the event	0.62			

Table 1. *Cont.*

Sustainable Development Goals		Item Description	SoS	EcS	EnS	α
Number	**Goal**					
Economic Sustainability (EcS)						0.68
1.	No poverty	Our organisation ensures the inclusion of people living in poverty at the event		0.61		
3.	Good health and well-being	Our organisation ensures good health and well-being of all participants at the event		0.36		
9.	Industry, innovation and infrastructure	Our organisation ensures the use of qualitative infrastructure at the event		0.67		
12.	Responsible consumption and production	Our organisation ensures the reduction of waste generation at the event		0.58		
17.	Partnerships for the goals	Our organisation ensures engagement in effective public, public–private and civil society partnerships to organise the event		0.53		
Environmental Sustainability (EnS)						0.82
6.	Clean water and sanitation	Our organisation ensures adequate sanitation and hygiene facilities at the event			0.65	
7.	Affordable and clean energy	Our organisation ensures the use of renewable energy at the event			0.65	
11.	Sustainable cities and communities	Our organisation ensures environmentally friendly transportation at the event and towards the event			0.68	
13.	Climate action	Our organisation ensures the reduction or the compensation of the carbon emissions at the event			0.81	
14.	Life below water	Our organisation ensures the reduction of water pollution at the event			0.69	
15.	Life on land	Our organisation ensures the protection of the fauna and flora at the event			0.50	

Note: $n = 303$. All factor loadings are significant at $p < 0.001$. α = Cronbach's alpha. SoS = social sustainability, EcS = economic sustainability, EnS = environmental sustainability.

3.2. Sustainable Performance of Participatory Sports Events

To answer the first sub-question, the sustainable performance of PSEs in Flanders was assessed, and significant differences between the three dimensions were analysed. Table 2 presents the mean values and standard deviations of the sustainability scores and the significant differences between the three dimensions. The average overall sustainability score is 3.49 (SD = 0.50). When looking at the three dimensions of sustainability, significant differences can be detected between all dimensions, with the most remarkable findings being the substantial lower score for environmental sustainability compared to the other two dimensions. On average, the Flemish PSEs score significantly better on social sustainability (M = 3.60, SD = 0.55) if compared to economic sustainability (M = 3.54, SD = 0.53, t = 2.63, $p < 0.01$) and to environmental sustainability (M = 3.34, SD = 0.59, t = 9.14, $p < 0.001$). Furthermore, a significant difference can be detected between economic and environmental sustainability (t = 9.23, $p < 0.001$).

Table 2. Results for sustainability in general, and results from a paired sample *t*-test for the three dimensions.

	Sustainability in General	Dimensions of Sustainability			Sig.
		Social Sustainability	Economic Sustainability	Environmental Sustainability	
All events ($n = 303$)	3.49 (0.50)	3.60 (0.55) ^{a,b}	3.54 (0.53) ^{a,c}	3.34 (0.59) ^{b,c}	^{a} ** ^{b,c} ***

Note: Mean values with standard deviations are in brackets. Results of the paired sample *t*-test with: *** $p < 0.001$; ** $p < 0.01$. ^{a}, ^{b} and ^{c} indicate the significant results from the paired sample *t*-test. Means with the same letter in superscript differ significantly.

3.3. Sustainable Performance According to the Characteristics of Participatory Sports Events

To address the second sub-question, comparative analyses were performed to detect differences regarding the profit sectors, sports, event sizes and number of events organised. Table 3 shows the results of the profit sectors. A noticeable difference can be detected between the civil society sector and the other two sectors. The civil society sector (M = 3.46, SD = 0.50, F = 5.38, $p < 0.01$) scores significantly lower on sustainability in general compared to the commercial sector (M = 3.82, SD = 0.47, F = 5.38, $p < 0.01$) and not significantly lower compared to the public sector (M = 3.79, SD = 0.45, F = 5.38, NS). Accordingly, for almost all the sustainability dimensions, the civil society sector has the lowest scores. The commercial sector, on the other hand, appears to have the highest sustainability score in general, with a remarkably high value for social sustainability (M = 4.14, SD = 0.64, F = 7.71, $p < 0.001$). Finally, the public sector also shows high values for overall sustainability, with the highest values recorded for economic sustainability (M = 3.89, SD = 0.44, F = 4.84, $p < 0.01$) and environmental sustainability (M = 3.62, SD = 0.53, F = 2.41, NS).

Table 3. Results from the one-way ANOVA by profit sector.

	Profit Sector			
	Civil Society Sector (*n* = 279)	**Commercial Sector (*n* = 10)**	**Public Sector (*n* = 14)**	**Sig.**
Sustainability in general	3.46 (0.50) [a]	3.82 (0.47) [a]	3.79 (0.45)	**
Social sustainability	3.57 (0.54) [a]	4.14 (0.64) [a]	3.90 (0.52)	***
Economic sustainability	3.52 (0.52) [a]	3.82 (0.58)	3.89 (0.44) [a]	**
Environmental sustainability	3.32 (0.59)	3.55 (0.42)	3.62 (0.53)	

Note: Mean values with standard deviations in brackets. Results of the one-way ANOVA test with *** $p < 0.001$; ** $p < 0.01$. [a] indicates the significant result of the Bonferroni post hoc test.

The results of the analyses between the three sports show no significant differences for sustainability in general (F = 2.88, NS). However, significant differences can be identified when looking at the three sustainability dimensions. Table 4 shows significant differences for social and environmental sustainability. In both cases, walking events (M = 3.24, SD = 0.68, F = 3.85, $p < 0.05$) score considerably lower if compared to cycling events for environmental sustainability (M = 3.45, SD = 0.50, F = 3.85, $p < 0.05$) and if compared to running events (M = 3.51, SD = 0.61, F = 7.03, $p < 0.001$) for social sustainability. Furthermore, significant differences can be noted between running events (M = 3.81, SD = 0.46, F = 7.03, $p < 0.001$) and cycling events (M = 3.57, SD = 0.50, F = 7.03, $p < 0.001$) regarding social sustainability. Although the differences are not always significant, the overall results indicate the lowest scores for walking events and the highest ones for running events, with the exception of environmental sustainability, for which cycling events score the highest. In the overall picture, running events show a remarkably high score for social sustainability, whereas walking events score very low on environmental sustainability.

Table 4. Results from the one-way ANOVA by sport.

	Sports			
	Cycling (*n* = 117)	**Running (*n* = 70)**	**Walking (*n* = 116)**	**Sig.**
Sustainability in general	3.53 (0.45)	3.56 (0.40)	3.40 (0.59)	
Social sustainability	3.57 (0.50) [a]	3.81 (0.46) [a,b]	3.51 (0.61) [b]	***
Economic sustainability	3.57 (0.48)	3.61 (0.45)	3.48 (0.61)	
Environmental sustainability	3.45 (0.50) [a]	3.32 (0.51)	3.24 (0.68) [a]	*

Note: Mean values with standard deviations in brackets. Results of the one-way ANOVA test with *** $p < 0.001$; * $p < 0.05$. [a] and [b] indicate the significant results of the Bonferroni post hoc test. Means with the same letter in superscript differ significantly.

Furthermore, significant differences with regard to overall sustainability and the respective dimensions were identified when looking at the size of the events (Table 5). Large-sized events (more than 1100 participants) appeared to perform significantly better on overall sustainability (M = 3.58, SD = 0.50, F = 5.42, $p < 0.01$), on economic (M = 3.65, SD = 0.50, F = 8.39, $p < 0.001$) and on environmental (M = 3.48, SD = 0.54, F = 6.52, $p < 0.01$) sustainability compared to small-sized events (fewer than 538 participants). In addition, between medium-sized events (between 538 and 1100 participants) (M = 3.61, SD = 0.50, F = 8.39, $p < 0.001$) and small-sized events (M = 3.37, SD = 0.54, F = 8.39, $p < 0.001$), a significant difference can be detected for economic sustainability. However, no significant differences can be detected between the event sizes for social sustainability (F = 0.63, NS).

Table 5. Results from the one-way ANOVA by event size.

	Event Size			Sig.
	Small (*n* = 101)	**Medium (*n* = 104)**	**Large (*n* = 98)**	
Sustainability in general	3.36 (0.52) [a]	3.52 (0.45)	3.58 (0.50) [a]	**
Social sustainability	3.55 (0.53)	3.62 (0.51)	3.63 (0.61)	
Economic sustainability	3.37 (0.54) [a,b]	3.61 (0.50) [a]	3.65 (0.50) [b]	***
Environmental sustainability	3.18 (0.65) [a]	3.37 (0.53)	3.48 (0.54) [a]	**

Note: Small events: <538 participants; medium events: 538–1100 participants; large events: >1100 participants. Mean values with standard deviations are in brackets. Results of the one-way ANOVA test with *** $p < 0.001$; ** $p < 0.01$. [a] and [b] indicate the significant results of the Bonferroni post hoc test. Means with the same letter in superscript differ significantly.

Finally, when looking at the number of editions organised, no significant differences can be detected for either sustainability in general (F = 0.13, NS) or between the three dimensions (F_{SoS} = 0.55, ns; F_{EcS} = 0.33, ns; F_{EnS} = 0.51, NS) (Table 6).

Table 6. Results from the one-way ANOVA by the number of event editions organised.

	Number of Event Editions			Sig.
	Few (*n* = 95)	**Average (*n* = 96)**	**Many (*n* = 112)**	
Sustainability in general	3.48 (0.52)	3.47 (0.53)	3.50 (0.46)	
Social sustainability	3.64 (0.53)	3.56 (0.57)	3.61 (0.55)	
Economic sustainability	3.55 (0.55)	3.51 (0.55)	3.57 (0.48)	
Environmental sustainability	3.29 (0.66)	3.37 (0.60)	3.36 (0.51)	

Note: Few: <10 event editions; average: 10–25 event editions; many: >25 event editions. Mean values with standard deviations are in brackets. Results of the one-way ANOVA test show no significant differences.

4. Discussion

Sports have a significant global outreach and should, like other sectors, be accountable for its actions and make contributions towards a sustainable future. However, the standardised monitoring of and reporting on sustainability is still underdeveloped in the sector, especially with regard to the popular and fast-growing PSE sector [15–17,19]. Moreover, scientific research that investigates the characteristics of PSEs and relates them to sustainability is scarce [6,7,9], when in fact, empirically underpinned knowledge will be important to enhance their sustainable performance. The SDG framework created by the UN can help to tackle these challenges, particularly because of its central role in the international discussion on sustainability. To further the application of the SDGs in a sports context, a main research question and two secondary research questions were put forward in the presented paper. They aimed to fill the gaps in the current literature and improve the knowledge of sustainability in PSEs.

The main research question was whether or not a research instrument could be constructed based on the UN's SDGs to measure the sustainability of PSEs. The SDGs were established by high-level representatives and serve to enhance sustainability in all its three dimensions [64]. As a matter of fact, the UN urges the application of the SDGs as a measure and monitoring framework for different sectors, varying from micro-organisations in the private sector to international organisations in the non-profit sector and vice versa [2]. Apart from SDG 4, which was not applicable to the PSE sector, all other items identified by the UN as relevant for sustainability were used to create the instrument. As a result, this paper establishes the first evidence of content validity for the constructed research instrument. Furthermore, the results of the CFA suggest that the three-dimension structure of the instrument provides an adequate fit to the data, and the reliability tests indicate acceptable values for the dimensions. Thus, this research also provides evidence for the construct validity, which indicates its usefulness for measuring sustainability, differentiating three dimensions—social sustainability, economic sustainability and environmental sustainability.

The first sub-question was to analyse the performance of PSEs in Flanders, Belgium, in terms of sustainability. The findings of this study indicate that PSEs score considerably less on environmental sustainability when compared to social and economic sustainability. McCullough and colleagues (2020) pointed out that, indeed, a disequilibrium exists between the evaluation of economic and environmental impacts of sports organisations [37]. Multiple authors have underscored this insight by reporting the economic impacts of small-scale sports events [9,35,46,47,53]. Furthermore, an extensive overview can be given of research that evaluates the social impact of sports organisations and the social legacy of sports events [8,9,14,36,43–45,53]. The extent of the literature concerning economic and social sustainability is not surprising since the traditional aim of most sports organisations is to provide physical activity opportunities while trying to be economically healthy. Environmental sustainability, on the contrary, is a rather new management trend and has only recently become relevant for sports managers to a greater extent [6,65]. Nevertheless, a growing number of sports organisations are aware of their environmental impact, resulting in a plethora of different policies, standards and reporting processes that are hardly comparable. In recent years, scholars have tried to empirically underpin these processes, often leading to complex and detailed analytical measurement methods [51,52]. Thus, although a gradual increase in the literature is noticeable, the lack of standardised measurements remains problematic [37]. In this context, it has to be noted that Kates and colleagues (2001) emphasise that, scientific exploration and practical application are entangled and have the tendency to influence each other [66]. Therefore, the discrepancies between environmental sustainability and the other two dimensions that have been observed for Flemish PSEs cannot be considered a surprise and might be explained by the newness and underrepresentation of the topic. Limited literature results in limited knowledge and, as scholars have stated, knowledge is an important step towards formalised strategic planning and the practical implementation of sustainability [67]. Trendafilova et al. (2013) provide evidence for this statement in their research and indicate that besides the lack of knowledge, the possible financial repercussions are also a constraint for sports managers to invest in environmental sustainability [68]. Nevertheless, investing in environmental sustainability appears not to be in vain, as McCullough et al. (2020) state that an increased focus on environmental sustainability potentially generates a positive impact on organisations' economic and social objectives [37].

The second sub-question was to analyse if significant differences could be observed between the different profit sectors, sports, events sizes and number of event editions organised. The lowest scores for sustainability in general were noted for the civil society sector, walking sports events and smaller events. The number of organised event editions seemed not to influence the sustainable performance of an event. There are multiple factors that need to be considered to understand why PSEs with particular characteristics might perform better or worse on sustainability. The knowledge of sustainability and the financial

aspects were already mentioned as factors that might account for these differences. While some factors can be considered as barriers, other factors can be identified as motives for an organisation to act more sustainably. Some of the motives pinpointed by scholars are the creation of a competitive advantage, the enhancement of partnership relations, the creation of new marketing opportunities and the improvement of the organisations' image. However, societal pressure appears to be the most recurring reason, especially in environmental-related research [68–71]. While the societal pressure is applicable for all profit sectors, the other motives are most relevant for the commercial sector, which partially could explain its slightly higher score on sustainability in general. However, the findings described for the second sub-question are not directly in line with the research of Gallo and Christensen (2011), who studied sustainability in a non-sports-related context. They found that public organisations are more likely to perform better in sustainability in general compared to commercial organisations, arguing that public organisations are subjected to a wider range of stakeholders, which would result in more and different perspectives on and expectations of sustainability [54]. The findings described above for the organisers of Flemish PSEs indicate very limited differences between public and commercial organisations. However, the public sector performs better on economic and environmental sustainability compared to the commercial sector. The explanation of Gallo and Christensen (2011) might, therefore, hold some truth for the sports sector as well. Indeed, the public sector in Flanders has to answer to a certain number of stakeholders and is the initiator of recent sustainability campaigns in the sports (event) sector [72]. As a result, an exemplary function of the sector is expected, which contributes to the existing societal pressure and could, therefore, explain the higher score for environmental sustainability.

While significant differences are not apparent between the public and the commercial sector in this study, a clear discrepancy is noted between the latter and the civil society sector. Another factor that might explain the sustainable performance of a PSE is the innovativeness of an organisation. As mentioned above, environmental sustainability is still a rather new topic, and some organisations consider it a marketing opportunity and use the trend to create a competitive advantage [70]. Having an innovative mindset and, therefore, being an early adopter of renewal and improvements is an important characteristic to becoming a leader in the field, something the civil society sector, opposite to the commercial sector, is not renowned for [73]. Being sustainable and improving sustainable performance, however, is partially the result of change and innovation processes within an organisation and, therefore, might explain the lower scores for the civil society sector on sustainability. Bierly et al. (2009) state that the civil society sector prefers to innovate in their knowledge comfort zone, which is supported by Winand et al. (2016) [74,75]. This prevents the sector from making sizable changes but might explain the relatively higher scores on their core business, social sustainability. On top of that, the civil society sector is typically run by a substantial number of volunteers, which makes it significantly more resistant to change than commercial organisations [73]. However, to make more definite statements about the civil society sector, motives and thresholds for implementing relevant changes should be explored in future research.

Some factors that might clarify why walking PSEs perform weaker on sustainability compared to events organised in cycling and running were already addressed—knowledge, financial aspects and innovativeness. It is not unlikely that a combination of these factors might explain the findings since the increasing popularity of PSEs in Flanders [19] and throughout the world [15–18] did not affect all sports at the same time. Cycling, for instance, has been a popular participant sport in Flanders for ages, with the first annually organised PSE dating back to the beginning of the last century [76]. A first rise in the number of running events in Flanders was noticeable in the year 1987 [77]. Walking sports, on the contrary, has only seen a considerable increase in popularity in recent years [78]. Although exact data on walking events in Flanders is lacking, it can be assumed that the number of organised events is in line with the recent popularisation of the sport. It is not unlikely that walking sports events are lacking some of the abovementioned resources and capabilities.

However, it is important to note that these resources and capabilities do not simply occur throughout time. The results of this study show that the number of event editions that have been organised in the past does not seem to influence the sustainability of an event directly. These findings insinuate that the resources and capabilities necessary to make changes and implement sustainability improvements do not emerge when more editions of the same event are being organised. In turn, if creating more sustainable events is the aim, targeted actions could be called for. Examples could be to increase specific sustainability-related knowledge of event organisers or assist them with the financial repercussions of implementing such improvements. Of course, other factors can be considered that might explain the weaker sustainability performance of walking events, and further research is needed to see if this picture also shows in other contexts and, if so, what the reasons are.

The findings of the study also indicate that larger events perform better in sustainability compared to smaller events. These results are not surprising since they are in line with the research of Gallo and Christensen (2011) and Bansal (2005) [54,55]. It can, therefore, be concluded that the assumption that the size of an organisation matters in terms of its sustainability performance holds true for the sports (event) contexts as well. Although previous research did not specifically focus on the sports sector, it was noted that improving and reporting an organisations' economic, social and environmental impacts may require substantially more resources and capabilities than smaller organisations can rally on [54]. The importance of these resources was already discussed, and it can be assumed that this partially explains the discrepancies between small and large PSEs. However, it has to be noted that while the former's lack of resources appears to be detrimental to environmental and economic sustainability, social sustainability does not seem to differ significantly. Social sustainability is at the core of most sports organisations, and it is, therefore, not surprising that this is reflected in the corresponding performance of the PSEs regardless of their size.

To conclude this discussion, some limitations and recommendations for future studies have been considered. First, only one representative from each PSE was asked to fill in the survey. Despite the rather high level of experience and the leading positions of the respondents, it can be questioned whether they had sufficient knowledge on the topic to answer all questions accurately. Second, the panel predominantly consists of events organised by actors in the civil society sector. The findings of the present study, however, are based on a sample that adequately represents the Flemish event sector, and, therefore, cautious generalisation is possible. Nevertheless, it is recommended that future studies should focus on commercial and public event organisations and include larger sample sizes to critically assess the findings of this study. Third, the information about the sustainability of the events has been provided by the event organisers themselves. It is, consequently, subjective information and vulnerable to a certain amount of social desirability, which should be taken into account when interpreting the results. As this study is the first of its kind, upcoming research should apply the developed instrument on larger samples and in international contexts to further validate and refine the instrument and the results. It is also recommended that prospective studies investigate PSEs from a more theoretical point of view. This will allow researchers to thoroughly scrutinise internal and external determinants that might influence the sustainability of PSEs by, for example, making use of the institutional theory, the organisational capacity theory or one of the other theoretical approaches that are suited for this type of research. Despite the mentioned limitations, the study offers valuable insights into a yet underrepresented research field and can serve as a venture point for future empirical examination of sustainability in PSEs.

5. Conclusions

This study aimed to contribute to the current literature by constructing a research instrument to measure and assess sustainability and its three dimensions (i.e., social, economic and environmental) in PSEs. Until recently, the implementation of the SDGs into a measurement tool was uncharted territory, despite the calls to bridge the gap between sports and the SDGs. First, evidence for reliability and validity was provided in such

a way that this study may serve as a starting point for future research to improve the instrument and increase evidence for its validity. Furthermore, the study provides empirical analyses of data concerning sustainability in PSEs. The findings constitute a status quo, highlight particular challenges for PSEs and can serve as a benchmark for follow-up studies. More specifically, the study identified a considerable backlog in the field of environmental sustainability compared to social and economic sustainability. Furthermore, the research shows that, at least in Flanders, walking events and events organised by the civil society sector have the greatest opportunities to increase their performance compared to their counterparts. Large-sized events appear to perform better in most dimensions of sustainability, while the number of past event editions seems to not influence the sustainability of an event. With these contributions to the literature, this research can be interesting for researchers, sports managers and policymakers and should help to enhance the sustainability of PSEs.

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