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Decoding Sustainability Signals: Spectator Perspectives at the 2022 European Championships

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Abstract

In this study, we aimed to explore event-related signals related to sustainability at the 2022 European Championships in Munich. Drawing upon spectator perspectives and participant observations, we examined how event organisers promoted sustainability at the event, including the contextual and organisational considerations that influenced the interpretations of event sustainability goals. Grounded in signalling theory, the findings revealed that there was a difference in interpretations between bottom-up signals (directly observable) and top-down signals (beliefs and expectations) with respect to the broad understanding of sustainability. These differences were most apparent for spectators concerning social and economic event signals. The directly observable signals emphasised environment-related sustainability, while the top-down signals about social considerations were often overlooked. Event organisers capitalised on some ceremonial moments at the event to bring about greater awareness, but these practices were limited. Event organisers need to consider how to capitalise on both top-down and bottom-up signals to emphasise the sustainability messaging for all stakeholders.

Keywords: sport event; signalling theory; sustainable development; event management

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Introduction

Sustainability has become increasingly important for organisers of sport events (Boykoff, 2021). Concurrently, communicating their commitment to sustainability, so-called signalling (Connelly et al., 2011a; Connelly, et al., 2011b), is critical for several reasons. First, signalling is an opportunity to create shared sustainability values and engagement with event visitors (Newig et al., 2013). Second, sport events provide a platform to educate and raise awareness about sustainability (Schmidt, 2006; United Nations, 2022; United Nations Framework Convention on Climate Change, 2015). Prior research at the nexus of sport and sustainability communication has focused exclusively on fans. Scholars have examined fandom's role to increase attitudes and behaviours regarding environmental sustainability (e.g., Casper et al., 2014, 2017; Inoue & Kent, 2012; McCullough & Kellison, 2016). In the sport event context, Trendafilova et al. (2021) studied online communication during tennis Grand Slams, suggesting that event messages were mainly focused on energy and water initiatives. Similarly, Trail and McCullough (2021) explored the awareness of event-related promotion activities, emphasising the importance of campaign messaging to influence sustainable behaviours. They found that attitudes can predict behavioural intentions and directly impact individual responses to sustainability initiatives. In other words, the signals conveyed through and at an event can have a direct impact on environmental behaviours. Other scholars have broadened out the research on sustainability to emphasise the social and economic aspects. For example, McCullough and Trail (2021) studied a social sustainability campaign targeted at athletes' caretakers at a

Special Olympics event, and Piggin et al. (2019) explored the discrepancy between policy and event reality regarding health promotion at the Rio Olympics. These are important extensions of sustainability which align with the United Nations' goals for economic growth, social inclusion and environmental protection (United Nations, 2022).

In this research we focused on the sustainability campaign of the 2022 European Championships in Munich. Our aim was to expand on the previous research by Trail and McCullough (2021) and explore how event organisers designed their sustainability efforts to ensure that spectators are aware and act in a way that reflects those sustainability goals. This is important, as research has indicated that the amount of information about the sustainability efforts of the event organiser is directly related to spectators' sustainability behaviours. By employing qualitative approach, we sought to understand the broader contextual perspectives on the factors that influence spectators' interpretations of sustainability within this unique context. Specifically, employing an instrumental case study of the 2022 European Championships, we explore spectators' interpretations of sustainable signalling and the characteristics of both bottom-up signals (exogenous – externally observable) and top-down signals (endogenous – internal beliefs and expectations). We are guided by two research questions: (1) What event-related signals do spectators at the 2022 European Championships interpret as sustainable according to their bottom-up and top-down perspectives? (2) What contextual and organisational considerations influence the perception and interpretation of sustainability signals by the 2022 European Championships spectators?

Literature Review and Theoretical Background

Defining Sustainability

Sustainability refers to sustaining or perpetuating a system for a long time (Costanza & Patten, 1995). Sustainable development "meets the needs of current generations without compromising the ability of future generation to meet their own needs" (World Commission on Environment and Development, 1987, p. 23). Sustainability can also be viewed through fundamental principles (Waas et al., 2011): (1) it is a construct of societal and normative nature; (2) it implies justice or fairness; (3) environmental and developmental matters need a holistic address; and (4) it is a dynamic process.

Sustainability is an ambiguous and context-dependent notion, enabling many interpretations (Kemp & Martens, 2007; Perey, 2015; Whyte & Lamberton, 2020). Local, social practices and a sense of community influence these sustainability interpretations. People understand sustainability primarily as longevity, keeping something running, or human, material and other resource use (Parkin Hughes, 2017; Reid & Petocz, 2006; Reid et al., 2009). Research on consumers has primarily focused on the environmental dimension of sustainability, which, with the increasing media attention to the natural environment, has likely contributed to the misconception that sustainability is only about the environment (Simpson & Radford, 2012). Consumers often do not understand the sustainability characteristics of products or services (McDonald & Oates, 2006; Tölkes, 2018, 2020) and their understanding heavily involves environmental components, including resources and waste (Hill & Lee, 2012; Roy et al., 2015; Simpson & Radford, 2012). Furthermore, Roy et al. (2015) found that consumers could not articulate precisely what behaviours would be considered sustainable.

Promoting Sustainability through (Sport) Events

Scholars have emphasised the need to address the sustainability of events beyond environmental issues, broadening the perspective to reflect triple bottom line considerations (Getz, 2017; Mair & Smith, 2021; Pernecky, 2013). Mair and Smith (2021) considered the role of events in the context of the host destination's social, economic and environmental characteristics. In that vein, the focus on establishing the sustainability of sport events should be supplemented with communication aspects for education and promotion of sustainability to and through various stakeholder groups (e.g., Collins et al., 2009; Müller et al., 2021; Trendafilova et al., 2022).

The potential of events to promote sustainability has been recognised within the literature (Laing & Frost, 2010; Mair & Laing, 2013; Tölkes & Butzmann, 2018; Wong et al., 2021). Examining sport events specifically, Han et al. (2015) contrasted spectators' pro-environmental behaviour at the event and at home. Findings have shown that attendees behave more pro-environmentally at home than at the event and that this relationship is moderated by the perception of event's environmental responsibility. Du Preez and Heath (2016) highlighted the role of the social and physical environments in the intention to behave pro-environmentally. They concluded that the identification with the social context at the sport event may be beneficial to the intention to behave pro-environmentally and that the spectators attached to the location are more likely to value and support the environmental efforts of event organisers. Environmental sustainability marketing campaigns have focused on sport fans/spectators by leveraging their identification with the team (e.g., Casper et al., 2014, 2017; Inoue & Kent, 2012; McCullough & Kellison, 2016). For example, Trail and McCullough have developed and tested behavioural models for

fans/participants to assist event managers in implementing and evaluating sustainability campaigns (Trail, 2015, 2016; Trail & McCullough, 2017). These models emphasised the awareness stage, which is highly dependent upon culture and context, and the external activation of the campaign. Furthermore, campaign awareness, amount of information, and satisfaction with communications were directly related to spectators' attitudes and behaviour. As demonstrated, previous research has foregrounded the importance of sustainability event communication for spectators' (environmentally) sustainable intentions and behaviours. Thus, we use signalling theory to frame our research as it has been proven to be the appropriate framework for studying ways organisations communicate their sustainability engagement to stakeholder groups. For example, Connelly et al. (2011b) highlighted signalling theory as an appropriate frame for studying sustainability marketing from both the company and the consumer perspectives.

Signalling Theory

Signalling theory explores how individuals, organisations, and other entities communicate characteristics, qualities, or intentions to others when two parties have different information about a common interest, that is, information asymmetry (Kirmani & Rao, 2000; Spence, 1973). The focus on resolving asymmetries of "latent and unobservable quality" (Connelly et al., 2011a, p. 42) is at the core of signalling. Fundamental tenets of the signalling theory relevant to this study include a signaller, a signal, and a receiver. As someone with insider knowledge, the signaller possesses exclusive information regarding the inherent quality of a subject, which they want to communicate to the receiver through signals. These signals serve as a means for the signaller to convey information to external parties. Receivers are outsiders with varying interests in the information and different backgrounds, values and

knowledge. How the signal will reach receivers depends largely on signal observability, that is, the extent to which the receivers can observe the signal as intended, hence demonstrating an effective signal (Spence, 1973).

Receivers and their responses have received little attention and usually the receiver has been viewed as a rational decision-maker with unanimous responses to signals (Drover et al., 2018). With that in mind, Drover et al. (2018) employed a cognitive lens to consider the receivers' attention allocation and interpretation. They posited that attention is a function of two ways of processing, top-down (systematic), or bottom-up (heuristic). Receivers with top-down processing have the endogenous stimulus, whereas stimulus for bottom-up processing is exogenous, meaning that it comes from the environment. A receiver with an endogenous stimulus has a goal in mind and scans their environment for a specific stimulus. When the stimulus is exogenous, it originates in the environment. Signals with low signal observability are more likely to be attended to by top-down receivers than bottom-up receivers because they have internal expectations and are seeking out the signals. However, high observability signals are expected to be noticed by both processing types (Drover et al., 2018). Both signal observability and personal experiences, knowledge and beliefs play a role in processing and interpreting signals. Receivers' beliefs, for instance, structure the experiences and determine what information the receivers will recall from their memory (Taylor & Crocker, 2022).

Signalling theory has been used in sport management studies focusing on numerous organisational perspectives. McCullough et al. (2020) explored ways North American sport organisations signal their environmental commitment on their websites. The findings demonstrated that many organisations do not display their

environmental commitments. Those that did, did so by highlighting fan engagement initiatives. Only one organisation in that study published an environmental report.

The literature has started to address the communication of sustainability primarily to sport fans with the idea of leveraging their fandom for more sustainable outcomes with scholars focusing on either environmental or social sustainability campaigns using signalling as grounding. Spectators have received minimal attention, particularly in the event literature, with the prevailing studies concentrating on initiatives related to environmental sustainability and employing quantitative research designs. Previous findings warrant a more in-depth inquiry into how spectators experience and interpret sustainability. Accounting for contextual factors through qualitative research design will offer in-depth information for event organisers on how to signal their sustainability efforts. Signalling theory provides the rationale for the inquiry process, serves as the reference point for the collected data, and justifies the methodological approach in distinguishing bottom-up and top-down spectators (Collins & Stockton, 2018).

Methodology

Context and Research Design

European Championships Management Sàrl (ECM) merged the European Championships of several sports into the same event (European Championships Management, 2022). The European Championships 2022 took place in Munich, Germany, embracing the values of unity, diversity, inspiration, longevity and sustainability (European Championships Management, 2022). The Local Organising Committee (LOC) issued a sustainability strategy outlining focus areas: the reuse of sport facilities and equipment, carbon-neutral transport and mobility, waste and littering, impact on grassroots and professional sport, inclusion and accessibility and

local value creation. The event was expected to gather around 4,700 athletes in 176 medal events and offer a festival experience for visitors (LOC European Championships Munich 2022, 2021). The event presented itself as an appropriate setting for studying sustainability in the sport context.

We employed a qualitative single case study design where the emphasis was not on the case itself, but rather the case was instrumental to providing insights into responses from the spectators (Stake, 2005). Our approach was based on the works of Stake (1995) and Merriam (1998) and aligned with the constructivist paradigm (Yazan, 2015). It allowed us to highlight multiple perspectives on the case, which is valuable, taking that sustainability means different things to different people (White, 2013), its meaning is contextual and must first be discovered (Porter, 2008). Hence, we used case study to illuminate complex phenomena directly in its context to enable holistic analysis (Tight, 2022). The depth of information about a case rests on the triangulation of the data collection, where multiple data points yield a rich account of the studied phenomenon (Merriam, 1998).

Data Collection

We used several methods to collect the data. In what follows, we briefly describe the methods that we have used.

Document and Social Media Analysis

Prior to the event, we consulted the official sustainability strategy of the event and conducted a document analysis (Morgan, 2022). This was essential for understanding the event context, particularly the six strategy foci (facilities and equipment, transport and mobility, waste and littering, grassroots sport, inclusion, and regional value creation). We also analysed the event's relevant social media accounts, including Instagram, YouTube, Facebook and the official newsletter prior

to, during and after the event inductively (Thomas, 2006) after having filtered those posts that referred to sustainability initiatives.

Participant Observation

Based on the six strategic foci of the event, we defined an observation guide. Although the observation guide served as guidance, the primary onsite researcher observed the environment also through her view of sustainability. The first author acted as the participant observer, engaging in social situations appropriate for the setting with a dual observer role (Spradley, 1980). Participant observation enables gaining "insights concerning the behaviour, motivations, attitudes and perceptions of people within the culture in question" (Jaimangal-Jones, 2014, p. 42) and has been suggested for event-related research (Jaimangal-Jones, 2014; Mackellar, 2013). The first author attended multiple sporting and cultural events during the 2022 European Championships, assuming the role of spectator, festival visitor and participant in a 10k race for the public. Field notes were drafted daily and facilitated the reflective practice of features often taken for granted to create a comprehensible account of otherwise hectic social situations (Emerson et al., 2011).

Informal and Semi-structured Interviews

During the event, we engaged in informal discussions with the event visitors as well as representatives of the sponsoring brands, volunteers, entertainers and members of national delegations. Such conversations can facilitate communication and help obtain more naturalistic data (Swain & King, 2022).

After the event, we interviewed 12 spectators in German who resided in Germany (Table 1) throughout September and October 2022 using semi-structured interview guidelines (Magaldi & Berler, 2020). We used purposive and convenience sampling, asking some interviewees to participate at the event, and contacting others

using snowballing. Before participating in the interview, the interviewees read the letter of information about the study outlining ethical considerations. They verbally consented to the recording of the interview and the pseudonymised use of the data.

Semi-structured interviews helped establish a link to signalling theory but left the possibility to probe. Examples of the questions posed included: Can you please define sustainability? How do you practice sustainability in your daily routine? What comes to your mind first when you think about your experiences at the 2022 European Championships? Was there anything at the event that you considered sustainable or unsustainable?

<<<INSTERT TABLE 1 ABOUT HERE>>>

Data Analysis

The data analysis and collection ran in parallel until we deemed the interview data held enough information power and reached saturation (Malterud et al., 2016). The first author analysed the data guided by Braun and Clarke's (2021) reflective thematic analysis. Such an approach was suitable for this study, considering the theoretical distinction between bottom-up and top-down processing of signals. Interview data were transcribed verbatim and, with fieldnotes, documents and social media posts, managed with MAXQDA.

The analysis started with rereading the data, memoing, and coding (open and axial). The coding followed a fluid and organic approach (Braun & Clarke, 2021). We analysed the data first inductively, creating concrete codes, that is, codes that carry explicit meaning, reflecting interpreted sustainability signals. This analysis highlighted the prominent signals in the data. We then used these codes deductively to focus the analysis on the context surrounding them. This further analysis yielded conceptual themes, that is, abstract concepts, reflecting characteristics of visible signals, aligned

with the research questions (Hennink et al., 2017). While coding, we considered a bottom-up and top-down processing dichotomy, as outlined in Drover et al. (2018). The first author generated themes that she revisited until the themes gave a coherent and complete representation of the data, and then reviewed and discussed these with the research team to reach consensus.

To ensure the trustworthiness of the study, we focused on credibility, dependability, and reflective practice (Guba & Lincoln, 1989; Nowell et al., 2017). To establish credibility, the first author engaged in 50 hours of participant observation spanning 11 separate event days. We triangulated the data sources (participant observation, social media and interviews) and used peer checking, that is, seeking verification of findings with fellow researchers from the team via regular meetings. A criterion of transferability was ensured through a thick description of the research context, participants, and data collection methods, allowing readers to determine the relevance of the findings to their own contexts. Finally, we focused on dependability, making sure the research process is logical, traceable, and clearly documented (Stahl & King, 2020). We were also aware of our own biases and unique values and interests. In addition to the first author, a researcher with expertise on sustainability and strategic management in sport organisations and a Munich resident was involved as well as the rest of the research team consisting of three scholars with expertise in sport events, legacy, and sustainability.

Findings and Discussion

With this study, we aimed to understand how spectators at the 2022 European Championships interpret event-related sustainability signals and reveal contextual and organisational considerations that influenced the attention to and interpretation of

sustainability signals. The data analysis generated three themes, which we describe and discuss below.

Theme 1: Interpreted Signals

Here, we highlight the interpreted event-related signals and how they vary from bottom-up and top-down spectator perspectives (Tables 2-3) and elaborate on non-environmental signals: inclusion, local value production, as well as health and sport promotion. The findings show that both the spectators and the first author attended to and interpreted several sustainability signals. However, one crucial difference is that spectators mostly focused on the environmental signals as these were most directly observable. When they spoke about the social and economic signals, they did not refer to sustainability directly nor did they recognise this as part of the sustainability efforts.

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Inclusion

Data from the interviews demonstrated that signalling inclusive aspects of the event's sustainability strategy was difficult. Some spectators reflected on social aspects but did not necessarily link this to sustainability. For instance, Leni, when referring to events' accessibility due to their location, also thought about how free events enabled everyone to take part, which should positively affect sport promotion. They, however, did not connect sport promotion with sustainability, as was the case with the principal author.

> *… and it's just in the centre and accessible for everyone. I think the spectators at the triathlon didn't need a ticket, at the mountain biking either, you could walk by because it's in the open. Um, that's already cool and I think that's how you get people excited about the sport.* (Leni)

The accessible venue design, more inclusive services and opportunities for spectators with disabilities, such as the availability of sign language interpreters or an opportunity to volunteer, were also not readily interpreted as sustainability initiatives. An exception was one spectator, Chia-hao, who reported that they looked for inclusive elements in the event environment, indicating a top-down approach:

> *I noticed barrier-free parking spaces and, um, barrier-free entrances. Also, a certain wheelchair accessible zone, where you can watch the events. And there were also sign language interpreters for the matches*. (Chia-hao)

The 2022 European Championships offered an integrated programme including para- and non-para sports events. The social media campaign 'Athletes of 22', where 11 German athletes were followed in preparing for the event, featured one para-athlete. As indicated in the fieldnotes, the integrated event was, for the first author, a clear signal towards the event's sustainability by providing exposure to parasport. This is aligned with previous research, suggesting that integrated events could contribute positively to increasing awareness of disability and improving attitudes towards people with disabilities (Misener et al., 2015a; Paradis et al., 2017). However, our findings indicate limited attention to the para-events from bottom-up signalling perspectives. Although our research design does not allow us to suggest this conclusively, it could be the case that due to the small number of para-events, marketing and media representation were insufficient for spectators to recognise this as a signal needed for the attitude change (Misener et al., 2015a).

In general, the space in the Olympic Park during the sport events and festival was a place where people of various nationalities, ethnic backgrounds, abilities, ages and roles mingled. The location, free activities, and various types of events facilitated the event's inclusivity. For instance, the event featured the partners' stands

promoting various organisations, some of which had a clear social focus, for instance, the initiative Pink Kids, which organised sport events for children whose mothers have breast cancer. The first author interpreted this as a sustainability signal, yet only very rarely did spectators view this as a sustainability signal. For instance, Katharina noted the following:

> *At Königsplatz, I think there were three stands on sustainability and on inclusion. I think there was a stand on, um, equality for the (…) LGBTQ community*. (Katharina)

The interviewees who expressed their excitement about the atmosphere and regarded the event as a place of encounter did not interpret this as a sustainability signal but rather as a general positive aspect of the event.

Local Value Production

An emphasis on local value production was most noticeable through sponsors and partners that promoted small local businesses or offered typical Bavarian foods and drinks. Although information about the origin of products was not readily available, the principal author interpreted traditional foods and drinks as a sustainability signal for the local supply chain. Also, Chia-hao interpreted this as an element of economic sustainability: *A bit of a contribution to the local economy.*

Health and Sport Promotion

This subtheme encompasses sustainability signals related to sport and physical activity promotion and other health-related signals such as nutrition. Spectators and volunteers shared the space with athletes in the Olympic Park. This was contrasted to other sport events where the athletes are usually separated from the spectators, creating a physical and symbolic social barrier. At the 2022 European

Championships, the integrated space was put in the context of sport promotion by Marina, who was uncertain if this aspect can be described as sustainable:

> *What I also liked was that, um, a lot of the athletes passed us after the race. So, it was quasi so open. (…) Well, I don't know to what extent I would describe it as sustainable, but you had the feeling that you were more on the same level and not as isolated as it was, for example, in football. So, that makes the athletes more human and that would motivate me to identify with them (…) if I were a 10-year-old there.* (Marina)

Furthermore, spectators could compete in various competitions aimed at promoting healthy living through sport and physical activity. Yet, this was interpreted as a signal towards sustainability only by the principal author and not by the spectators. These physical activity and sport offerings were meant to stimulate people to be more physically active during the event and hopefully beyond. Many partners focused on local sports or physical activity promotion, some with inclusive mandates. Chia-hao reflected on the German Paralympic Committee Youth stand*:*

> *I have seen in the Olympic Park, there was a small event for children. They sat in wheelchairs and there are many barriers on the terrain. And then they experience what it's like to sit in a wheelchair and overcome all these barriers. Yes, it was quite a good event.* (Chia-hao)

These types of try-out events have been identified elsewhere as opportunities to influence awareness and attitudes about inclusion, but often the messaging is missing to create lasting change (Misener et al., 2018). In this case, while some spectators with high levels of social awareness may have interpreted the try-out events through a sustainability lens, few understood the clear connection of para-sport try-out sessions to sustainability.

The drinks and foods provided on-site were mostly considered unsustainable. Most of the food and drinks offerings were typical fast food in line with the Bavarian tradition to drink beer and adopt a meat-heavy diet, with healthier options as an exception. Food options were mostly unhealthy and, since they were meat-heavy, less sustainable. Spectators noted the meat-heavy offerings as a negative environmental sustainability aspect but did not connect the health aspect of food offerings with sustainability.

The tendency of spectators to equal sustainability with environmental sustainability aligns with previous literature that considered different spectator groups (Hill & Lee, 2012; Roy et al., 2015; Simpson & Radford, 2012). Fischer et al. (2017) analysed the usage of the term sustainability in German newspapers and demonstrated that newspapers use sustainability mostly as longevity, followed by environmental sustainability. As the public discourse in Germany highlights these aspects, it is not surprising that the spectators of the 2022 European Championships primarily reflected on the environmental signals. This is visible when comparing our interpretations, encompassing more signals from top-down processors and a wider variety of environmental, social, and economic signals, with bottom-up processors. This does not necessarily mean that the spectators did not attend to social or economic signals elsewhere in the event, but they did not place them under the concept of sustainability. Even when they discussed issues such as using existing facilities that would be economically sustainable, they interpreted this in the form of environmental sustainability signalling of the event.

Regarding social and economic signals, the data analysis illustrated that spectators mostly did not refer to sustainability. However, when discussing the event in general, spectators described their bottom-up experiences and perceptions related

to social sustainability impacts such as facilitating social networks and civic pride or raising awareness about disability and other disadvantaged groups (Misener & Mason, 2006; Schulenkorf et al., 2022; Smith, 2009).

In particular, the spectators were unsure about various sport-related sustainability signals such as sport development, inclusion through sport or the promotion of physical activity and healthy lifestyles that sport organisations traditionally attribute to sport events (Misener et al., 2015b). Sport experts ascribed importance to public acknowledgement of sport and physical activity as contributors to sustainable development (Commonwealth Secretariat, 2020; Glibo et al., 2022). In that sense, the findings of this study indicate that the signals did not lead spectators to make the connection between sport and sustainability.

This myopic perspective may present an issue when non-experts evaluate sport events if their perspectives are limited only to the environmental component of sustainability, the one where sport events have the most room for improvement (Müller et al., 2021). In practical terms, this could be detrimental to the public willingness to host sport events, as Hugaerts et al. (2023) demonstrated, because spectators may interpret limited social impacts. Therefore, as the social and economic benefits of sport events are not as straightforward for interpretation, the sport events should invest even more effort to signal those to the broader public.

Theme 2: Signalling Sustainability through Connecting the Past with the Present

Using the existing facilities built for the Olympic Games in 1972 was prominent in the event's sustainability strategy. The use of existing facilities was also integrated into the event's brand. The spectators at the 2022 European Championships thought about the event as sustainable by drawing parallels to the facilities built for the Olympic Games in Munich in 1972. The facilities were a central point of discussion

for the spectators, highlighting how they were either existent, repurposed, or temporarily built. For instance, Leni highlighted that:

> *The (triathlon) course didn't have to be built from scratch. It was just there, and it was used accordingly. (…) it's sustainable, from the Olympics '72, and the things are still all there.*

What made this point even more prominent was the contrast to other examples of sport events that were not good examples of long-term use:

> *And I think that's really sustainable, because if you look at other sporting events where they create something from scratch and isn't used later… then that's really a huge plus point.* (Leni)

Some spectators recognised building the provisional venues as consuming energy, highlighting that this would also require resources. However, provisional venues were justified as they provided the public with access to grassroots sport and physical activity. The difference between the principal author and spectators in this regard was that spectators highlighted the reuse aspect rather than an opportunity for the public to get active:

> *You just did it [the public ten-kilometre run; added by the authors] in one go on the same day in the afternoon and used the whole infrastructure that was already set up anyway. And that's why I thought it was good.* (Fabian)

The spectators' focus on the sustainability of sport facilities is justified from an environmental point of view. For instance, Hedayati et al. (2014) calculated that most of the greenhouse gas emissions of a one-person stadium visit came from the construction and operation of the facilities. Similarly, at both the level of sporting events and within communities, ensuring the environmental sustainability of sport facilities is crucial. Sport facilities around the world (e.g., Canada) are strategically

engaging in various sustainability programs, with some even participating in certification programs (Mallen & Chard, 2012). These programs encompass considerations such as construction methods, energy consumption and harmonious integration with the surrounding environment (Francis et al., 2023).

The focus on the facilities by spectators is not surprising given that the 2022 European Championships occurred before the FIFA World Cup in Qatar, which spurred global sustainability concerns. The World Cup faced worldwide criticism for its new facilities potentially becoming white elephants (Meza Talavera et al., 2019). Amid these allegations and intense media scrutiny, the 2022 European Championships stood out as a good example of facility reuse. This could be attributed to the leverage gained by organisers due to the 50th anniversary of the 1972 Olympic Games. Organisers constructed a narrative around the synergy of the past and future, capitalising on this milestone event.

Through promotional materials placed across Munich, in offline and online media, the organisers built the event brand with reference to the Olympic stadium roofs and the rich history of the Olympic Park. For instance, the Olympic Memorial Centre was a provisional museum-like space where visitors learned about the 1972 Olympic Games. Located prominently on the lake in the park, it highlighted facility sustainability and introduced a new sports centre to support local Bavarian sports. All promotional materials featured roof contours, reminding the audience of the Olympic legacy, reinforced by the motto: Back to the Roofs. They invited visitors to the Roofs Festival and prominently used the hashtag #BackToTheRoofs on social media, highlighting the longevity of the facilities. Social media posts featured the continuous (re)use of the Olympic Stadium and presented photographs of the stadium dated to 1972 and 2002, saying:

> *Ever since the 1972 Summer Olympics Olympiastadion has been a special place for athletics! The last major athletics competition was the European Championships in 2002. We cannot wait to see the full stadium in 2022! (European Championships Munich 2022, 2022)*

By strategically choosing the locations in the city centre placed in front of the historical buildings (e.g., Königsplatz, Glyptothek), the organisers leveraged the city's history to showcase the event's sustainability. Using cities as a background to various events dates to ancient times, when public spaces were used and reused by combining transient elements with existing spaces. Recently, many sport events have used this approach to avoid construction and hopefully reduce costs (Azzali, 2019).

Our data reveals that this may have been a good marketing approach for various reasons. As suggested by Tinnish and Mangal (2012), the organisers integrated sustainability into the product by placing the event at known historic sites. This way, the sporting competition hinged directly on its location and displayed sustainability. This also allowed the integration of sustainability into marketing through the official event motto, where the main message was longevity and reuse. Similarly, research on Canadian festivals has revealed that a marker of a good festival sustainability practice was sustainability integrated into event's mission and vision and that it is clearly, consistently and sufficiently communicated (Dodds et al., 2020). Similarly, Trail and McCullough (2021) linked the amount of information with the success of the sustainability campaign.

Moreover, by strategically placing the events at historic locations and using known symbols, such as the roofs in Olympic Park, the organisers built on already existing associations; therefore, the association did not have to be newly introduced. Reminding the receiver of the signal is regarded as less complex and demanding

than introducing a new one in advertising: familiarity with the signal makes it easier to reach the receiver regardless of their attention level (Moriarty, 1983).

Lastly, the literature showed that communication based on the place attachment might be a good strategy to nudge the spectator's environmental behaviours (Du Preez & Heath, 2016). The same was found for the sport participants (Martins et al., 2022). Martins et al. (2022) suggested that the event organisers build a connection with the community using their environmental, social and cultural advantages to encourage environmental sustainability.

Theme 3: Environmental Sustainability Signalling through (Mis-)Alignment with Local and Sporting Practices

Environmental sustainability signals that the spectators interpreted as sustainable included event-related transportation options, waste management, cleanliness of the environment, and award ceremonies. One accompanying element of how these various signals were interpreted was how well they fit into the usual practices in Munich.

Some spectators attended to and interpreted sustainability signals (e.g., transportation and waste management) but rather as a confirmation of expectations than a positive surprise. They considered these practices as usual for Munich. In that vein, they were unsure if signals would be considered a sign of extra sustainability effort or the minimum for the local context. However, when the expected sustainability signal was not there, this was perceived as negative. This underscores the importance of comprehensive stakeholder engagement to outline the community expectations and align them with the sustainability event strategy, following good practice guidance (Harris & Schlenker, 2018).

Our findings accentuate, more specifically, that the communication has been adapted to local customs. Jani (2023) also demonstrated that locals and non-locals might have differing expectations regarding the event's sustainability through, for instance, the perception of festivals as 'ours' (locals) and 'theirs' (tourists) depending on the festival ownership, commercial vs. non-commercial orientation and target groups, among others. The author suggested building up a portfolio of festivals for locals and non-locals. International sports events are visited by people of different origins and cultures and, as such, present an environment for targeting various social issues through social interaction and building a community (Chalip, 2006; Misener et al., 2015b). Therefore, even though it is important for the locals to have their sustainability customs reflected in the event signals, it is equally relevant to signal and educate to non-locals what is locally usual.

From the sub-themes, it is visible that the spectators' interpretations of sustainability initiatives encompass multiple environmental areas that can potentially create an impact. Literature on events and festivals also highlighted that spectators' attitudes were formed based on multiple environmental considerations, including venues, catering, materials and accommodation (Santos et al., 2023).

Transportation

With the event ticket purchase, the spectators had an opportunity to use public transport, thanks to the event's partnership with the local transportation provider. This incentive to use public transport was interpreted as a nudge towards travel means that do not require large amounts of CO_2 output, albeit an expected one in Munich. On the free use of public transport for ticket holders, Sebastian commented as follows:

> *It's also somehow a classic, because it's also a sustainable aspect, um, that you can also use public transport with your ticket. So that they try to get people to travel by train or bus.*

Events in the city were spread out but always in a location that enabled spectators to arrive by public transport or bicycle. The placement of events centrally was interpreted as expected in Munich:

> *I think the locations of the events were very good in terms of being public transportation accessible. But that's the Munich thing usually that you don't see massive parking with hundreds of cars and everyone going there by car.* (Filipa)

Field notes revealed that during major events at the Olympic Park, the number of cyclists exceeded the capacity of the available bike racks. This is unsurprising in Munich, where the infrastructure makes cycling a comfortable and quick transportation option. Leni, for instance, used a bicycle to travel to different events:

> *I rode my bike around the city a lot during the week, because when I went to Königsplatz, I often went to the stadium afterwards, because that's where the evening sessions were, and it was really practical to cycle around.* (Leni)

Clean Environment

Event-related sustainability signals were often related to the clean environment. Positively, spectators noticed that the environment was not cluttered with excessive promotional materials and pompous prompts:

> *It wasn't that many posters and unnecessary arrows and so on were put up. Well, I don't think a lot of unnecessary rubbish was produced in that sense, but rather that the people led you and then really stood there and said: "Okay, that's the way".* (Lukas)

The organisers relied on providing information digitally, following the good practice suggestions in the events industry (Tinnish & Mangal, 2012). Spectators also highlighted the efficiency and purpose of the event concept, which required no excessive waste or resource use beyond what was needed for the event. Instead, a thought-through usage of existing resources was highlighted as sustainable:

> *It was just different and less rubbish was produced or (…) it was simpler. So, it wasn't so excessive; it was just simple and yet somehow beautiful and elegant, and the places were chosen in such a way that the place alone already had such an impact that you didn't have to install so much or add so much, but that the place alone had an effect.* (Fabian)

The topic of waste was prominent in the data, which resonates with McCullough et al.'s (2023) findings that the external stakeholders in sport emphasised waste management for more environmentally sustainable sport organisations. Likewise, Harris and Schlenker (2018) reported that event managers deemed waste management the most important concern for events' environmental sustainability. More specifically, in the context of attendee behaviour, compliance with waste policy, that is, the reduction of waste at the event, was brought forward as a challenge.

Waste is also a visible component of the sustainability strategy, which can easily be detected if its management fails. The waste management in our study was placed in the context of usual practices in Munich. This was particularly visible from speaking of the organisational measures, including the deposit system:

> *I think about it now, I got my cup in the stadium, which you can return with a deposit. But that's been the standard for years now, that you don't get a disposable cup.* (Fabian)

In contrast, the lack of separated waste bins for different types of waste, a standard in Munich, was perceived as a negative signal. Katarina expressed their surprise when they wanted to use the bin:

> *There was only one bin, well, only the residual waste bin. I think I wanted to throw away a banana peel and, uh, there was no organic waste bin. I was surprised about that.*

The sustainability strategy featured an extensive waste management concept, and visitors could read about it via a QR code on the waste bins.

Award Ceremony

A particular signal of the event that highlighted the commitment to sustainability was the award ceremony. The medallists received a plant designed to be planted in the Olympic Park called Champions Garden rather than the usual bouquet or stuffed toy. The campaign was prominently featured in the Olympic Park and on social media and was interpreted as a signal towards sustainability. For instance, Fabian emphasised:

> *What I think everyone noticed was that the athletes who were on the podium didn't get bouquets, but potted plants that could be planted in the athletes' garden or taken home. Um, so not everyone got a bouquet, which then somehow dried up after a few days and ended up in the bin.* (Fabian)

The symbolic plant and the opportunity to plant it in the garden were unusual for the medal ceremony. It received a prominent place within the ceremonial aspect of the sporting competition, where the spectators' attention was directed at the award ceremony. This reinforced Tinnish and Mangal's (2012) suggestion that for best marketing outcomes sustainability should be integrated into the product.

The possibility of public transport and bicycle usage to get to the event sites and the cleanliness of the environment featured prominently as environmental sustainability signals both in bottom-up and top-down approaches. Again, this can be attributed to the strengthened organisational efforts to highlight this, but an underlying reason might be that reported practices were imminent in the spectating experience. Travelling to the event or using the deposit system for drinks made spectators engage first-hand with some of the elements of organisational sustainability strategy, permitting their interpretation as a sustainability signal. If the signal is linked to a situation in which receivers must engage with it by directing their concentration or actively participating, this may be an effective way to place sustainability signals (Moriarty, 1983).

This explains why spectators mentioned a symbolic plant giveaway prominently as a sustainability signal. The award ceremony is a formal and festive occasion where the attention is usually directed at the medallists. In contrast, procurement considerations, albeit not always translated successfully from the sustainability strategy, did not materialise as sustainability signals. This could be because the organisers put less effort into ensuring or communicating a more sustainable merchandise procurement, so the information was not flashed out, but also because purchasing merchandise is not necessarily a focal part of most spectating experiences.

Conclusions

Contribution to Events-Related Research

In this study, we advanced the understanding of spectators' interpretations of event-related sustainability, delineating differences between top-down and bottom-up processing. While our top-down interpretations encompassed a wider variety of

environmental, social, and economic signals, spectators predominantly focused on environmental aspects. Our findings revealed that characteristics such as historical connections to past Olympic Games and alignment with local norms influenced sustainability interpretations. Moreover, we underscored the importance of integrating contextual and organisational considerations into designing sustainability communication, advocating for strategic alignment with past activities to reinforce sustainability initiatives. Additionally, this study emphasised the significance of incorporating local traditions and practices into sustainability promotion efforts. By recognising and leveraging local practices and norms, we proposed a more culturally sensitive approach to fostering sustainable practices.

Our research contributes to advancing the discourse on sustainability by highlighting the complexities inherent in interpreting sustainability signals. Through our exploration of bottom-up and top-down factors and the incorporation of broader contextual factors, we provide insights that can inform more effective and culturally resonant sustainability strategies within the context of sporting events. In terms of practice, that would mean that, first, there is a need to establish how sustainability is practised in the local context and which practices relevant to the event are considered a norm. Event organisers may try to exceed those already established practices for positive interpretations. Second, event organisers should integrate sustainability within the event's mission, vision and values and use the event's branding and multiple media channels to highlight this commitment and particularly the reuse of resources. Third, we suggest that an analysis be performed to evaluate what aspects of the spectator experience require the spectator's concentration or engagement and integrate sustainability signals accordingly.

Limitations and Outlook

The limitations of our work present an opportunity for future research. We focused on interpreting signals, which require spectators' attention. Yet, the time has passed from event attendance and the interviews, so spectators may have forgotten certain signals they attended to. Future work could focus on the attention phase of processing sustainably signals using real-time methods such as eye-tracking.

Furthermore, we did not quantify the perceived and interpreted signals as it was not aligned with our research aims. Future studies could quantify the perception and interpretation of various signals. By using the signalling theory from Drover et al. (2018), researchers could tap into the spectators' sustainability evaluation of events by quantifying positive and negative signals and their importance for the assessment. Also, the question of if and how sustainably signals translate to learnings about various aspects of sustainability and subsequently change behaviour was not addressed in the present study. Future studies may focus on these downstream consequences.

Despite these limitations, our findings revealed that event organisers should capitalise on both top-down and bottom-up signals to strengthen sustainability messaging for all stakeholders. The reception and processing of these messages are important because major events are often evaluated critically, with an increasing number of people demanding transparency and a voice in the use and distribution of public funds.

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References

Azzali, S. (2019). Mega sporting events and their impact on the built environment: Lessons learned from the past. *A|Z ITU Journal of the Faculty of Architecture*, *16*(2), 25-37. https://doi.org/10.5505/itujfa.2019.12499

Boykoff, J. (2021). Olympic sustainability or Olympian smokescreen. *Nature Sustainability*, *4*(4), 294-295. https://doi.org/10.1038/s41893-021-00710-w

Braun, V., & Clarke, V. (2021). To saturate or not to saturate? Questioning data saturation as a useful concept for thematic analysis and sample-size rationales. *Qualitative Research in Sport, Exercise and Health*, *13*(2), 201-216. https://doi.org/10.1080/2159676X.2019.1704846

Casper, J. M., Pfahl, M. E., & McCullough, B. (2014). Intercollegiate sport and the environment: Examining fan engagement based on athletics department sustainability efforts. *Journal of Issues in Intercollegiate Athletics*, *7*(1), 65-91. https://scholarcommons.sc.edu/jiia/vol7/iss1/13

Casper, J. M., Pfahl, M. E., & McCullough, B. P. (2017). Is going green worth it? Assessing fan engagement and perceptions of athletic department environmental efforts. *Journal of Applied Sport Management*, *9*(1), 11. https://doi.org/10.18666/JASM-2017-V9-I1-7690

Chalip, L. (2006). Towards social leverage of sport events. *Journal of Sport & Tourism*, *11*(2), 109-127. https://doi.org/10.1080/14775080601155126

Collins, A., Jones, C., & Munday, M. (2009). Assessing the environmental impacts of mega sporting events: Two options? *Tourism Management*, *30*(6), 828-837. https://doi.org/10.1016/j.tourman.2008.12.006

Collins, C. S., & Stockton, C. M. (2018). The central role of theory in qualitative research. *International Journal of Qualitative Methods, 17*(1), 1-10. https://doi.org/10.1177/1609406918797475

Commonwealth Secretariat. (2020). *Measuring the contribution of sport, physical education and physical activity to the Sustainable Development Goals.* Commonwealth Secretariat.

Connelly, B. L., Certo, S. T., Ireland, R. D., & Reutzel, C. R. (2011a). Signaling theory: A review and assessment. *Journal of Management*, *37*(1), 39-67. https://doi.org/10.1177/0149206310388419

Connelly, B. L., Ketchen, D. J., & Slater, S. F. (2011b). Toward a "theoretical toolbox" for sustainability research in marketing. *Journal of the Academy of Marketing Science*, *39*(1), 86-100. https://doi.org/10.1007/s11747-010-0199-0

Costanza, R., & Patten, B. C. (1995). Defining and predicting sustainability. *Ecological Economics*, *15*(3), 193-196. https://doi.org/10.1016/0921-8009(95)00048-8

Dodds, R., Novotny, M., & Harper, S. (2020). Shaping our perception of reality: Sustainability communication by Canadian festivals. *International Journal of Event and Festival Management*, *11*(4), 473-492. https://doi.org/10.1108/IJEFM-03-2020-0012

Drover, W., Wood, M. S., & Corbett, A. C. (2018). Toward a cognitive view of signalling theory: Individual attention and signal set interpretation. *Journal of Management Studies*, *55*(2), 209-231. https://doi.org/10.1111/joms.12282

Du Preez, E. A., & Heath, E. T. (2016). Determining the influence of the social versus physical context on environmentally responsible behaviour among cycling

spectators. *Journal of Sport & Tourism*, *20*(2), 123-143. https://doi.org/10.1080/14775085.2016.1227274

European Championships Management. (2022). European Championships Management Sàrl. https://www.europeanchampionships.com/about

Emerson, R. M., Fretz, R. I., & Shaw, L. L. (2011). *Writing ethnographic fieldnotes*. University of Chicago Press.

European Championships Munich 2022 [@munich2022]. (2022, April 22). *#BackToTheRoofs - ever since the 1972 Summer Olympics Olympiastadion has been a special place for athletics!*. [Photo]. Instagram. https://www.instagram.com/p/CcpRdyWINlc/?img_index=1

Fischer, D., Haucke, F., & Sundermann, A. (2017). What does the media mean by 'sustainability' or 'sustainable development'? An empirical analysis of sustainability terminology in German newspapers over two decades. *Sustainable Development*, *25*(6), 610-624. https://doi.org/10.1002/sd.1681

Francis, A. E., Webb, M., Desha, C., Rundle-Thiele, S., & Caldera, S. (2023). Environmental sustainability in stadium design and construction: A systematic literature review. *Sustainability*, *15*(8), 6896. https://doi.org/10.3390/su15086896

Getz, D. (2017). Developing a framework for sustainable event cities. *Event Management*, *21*(5), 575-591. https://doi.org/10.3727/152599517X15053272359031

Glibo, I., Misener, L., & Koenigstorfer, J. (2022). Strategic sustainable development in international sport organisations: A Delphi study. *Sustainability*, *14*(16), 9874. https://doi.org/10.3390/su14169874

Guba, E. G., & Lincoln, Y. S. (1989). *Fourth generation evaluation*. Sage.

Han, J. H., Nelson, C. M., & Kim, C. (2015). Pro-environmental behavior in sport event tourism: Roles of event attendees and destinations. *Tourism Geographies*, *17*(5), 719-737. https://doi.org/10.1080/14616688.2015.1084037

Harris, R., & Schlenker, K. (2018). An exploratory study of “best practice” in environmentally sustainable event management in Australian public events. *Event Management*, *22*(6), 1057-1071. https://doi.org/10.3727/152599518X15346132863175

Hedayati, M., Iyer-Raniga, U., & Crossin, E. (2014). A greenhouse gas assessment of a stadium in Australia. *Building Research & Information*, *42*(5), 602-615. https://doi.org/10.1080/09613218.2014.896141

Hennink, M. M., Kaiser, B. N., & Marconi, V. C. (2017). Code saturation versus meaning saturation: How many interviews are enough? *Qualitative Health Research*, *27*(4), 591-608. https://doi.org/10.1177/1049732316665344

Hill, J., & Lee, H. H. (2012). Young generation Y consumers’ perceptions of sustainability in the apparel industry. *Journal of Fashion Marketing and Management: An International Journal*, *16*(4), 477-491. https://doi.org/10.1108/13612021211265863

Hugaerts, I., Schunk, H., & Könecke, T. (2023). Environmental sustainability as factor for mega sport event support – empirical evidence regarding the Olympic Games and the football World Cup. *World*, *4*(3), 477-489. https://doi.org/10.3390/world4030030

Inoue, Y., & Kent, A. (2012). Sport teams as promoters of pro-environmental behavior: An empirical study. *Journal of Sport Management, 26*(5), 417-432. https://doi.org/10.1123/jsm.26.5.417

Jaimangal-Jones, D. (2014). Utilising ethnography and participant observation in festival and event research. *International Journal of Event and Festival Management*, *5*(1), 39-55. https://doi.org/10.1108/IJEFM-09-2012-0030

Jani, D. (2023). “Our festival, their festival”: The local perceptions of festival sustainability in Zanzibar festival portfolio. *International Journal of Event and Festival Management*, *14*(4), 460-474. https://doi.org/10.1108/IJEFM-10-2022-0086

Kemp, R., & Martens, P. (2007). Sustainable development: How to manage something that is subjective and never can be achieved? *Sustainability: Science, Practice and Policy*, *3*(2), 5-14. https://doi.org/10.1080/15487733.2007.11907997

Kirmani, A., & Rao, A. R. (2000). No pain, no gain: A critical review of the literature on signaling unobservable product quality. *Journal of Marketing*, *64*(2), 66-79. https://doi.org/10.1509/jmkg.64.2.66.18000

Laing, J., & Frost, W. (2010). How green was my festival: Exploring challenges and opportunities associated with staging green events. *International Journal of Hospitality Management*, *29*(2), 261-267. https://doi.org/10.1016/j.ijhm.2009.10.009

LOC European Championships Munich 2022. (2021). *The path to sustainability for the European Championships Munich 2022: Pre-event report*.

Mackellar, J. (2013). Participant observation at events: Theory, practice and potential. *International Journal of Event and Festival Management*, *4*(1), 56-65. https://doi.org/10.1108/17582951311307511

Mair, J., & Laing, J. H. (2013). Encouraging pro-environmental behaviour: The role of sustainability-focused events. *Journal of Sustainable Tourism*, *21*(8), 1113-1128. https://doi.org/10.1080/09669582.2012.756494

Mair, J., & Smith, A. (2021). Events and sustainability: Why making events more sustainable is not enough. *Journal of Sustainable Tourism*, *29*(11-12), 1739-1755. https://doi.org/10.1080/09669582.2021.1942480

Magaldi, D., & Berler, M. (2020). Semi-structured interviews. In V. Zeigler-Hill & T. K. Shackelford (Eds.), *Encyclopedia of personality and individual differences* (pp. 4825-4830). Springer.

Mallen, C., & Chard, C. (2012). “What could be” in Canadian sport facility environmental sustainability. *Sport Management Review*, *15*(2), 230-243. https://doi.org/10.1016/j.smr.2011.10.001

Malterud, K., Siersma, V. D., & Guassora, A. D. (2016). Sample size in qualitative interview studies: Guided by information power. *Qualitative Health Research*, *26*(13), 1753-1760. https://doi.org/10.1177/1049732315617444

Martins, R., Pereira, E., Rosado, A., Marôco, J., McCullough, B., & Mascarenhas, M. (2022). Understanding spectator sustainable transportation intentions in international sport tourism events. *Journal of Sustainable Tourism*, *30*(8), 1972-1991. https://doi.org/10.1080/09669582.2021.1991936

McCullough, B. P., & Trail, G. T. (2021). Transformative marketing: Health and well-being of Special Olympic athletes. *International Journal of Sports Marketing and Sponsorship*, *22*(3), 477-492. https://doi.org/10.1108/IJSMS-04-2020-0046

McCullough, B. P., Hardie, A., Kellison, T., & Dixon, M. (2023). Environmental perspectives of external stakeholders in sport. *Managing Sport and Leisure*, *28*(6), 670-683. https://doi.org/10.1080/23750472.2021.1950037

McCullough, B. P., Pelcher, J., & Trendafilova, S. (2020). An exploratory analysis of the environmental sustainability performance signaling communications among North American sport organizations. *Sustainability*, *12*(5), 1950. https://www.mdpi.com/2071-1050/12/5/1950

McCullough, B., & Kellison, T. (2016). Go green for the home team: Sense of place and environmental sustainability in sport. *Journal of Sustainability Education*, *11*(2). http://www.susted.com/wordpress/content/go-green-for-the-home-team-sense-of-place-and-environmental-sustainability-in-sport_2016_02/

McDonald, S., & Oates, C. J. (2006). Sustainability: Consumer perceptions and marketing strategies. *Business Strategy and the Environment*, *15*(3), 157-170. https://doi.org/10.1002/bse.524

Merriam, S. (1998). *Qualitative research and case study applications in education*. Jossey-Bass.

Meza Talavera, A., Al-Ghamdi, S. G., & Koç, M. (2019). Sustainability in mega-events: Beyond Qatar 2022. *Sustainability*, *11*(22), 6407. https://doi.org/10.3390/su11226407

Misener, L., & Mason, D. S. (2006). Creating community networks: Can sporting events offer meaningful sources of social capital? *Managing Leisure*, *11*(1), 39-56. https://doi.org/10.1080/13606710500445676

Misener, L., McPherson, G., McGillivray, D., & Legg, D. (2018). *Leveraging disability sport events: Impacts, promises, and possibilities*. Routledge.

Misener, L., McGillivray, D., McPherson, G., & Legg, D. (2015a). Leveraging parasport events for sustainable community participation: The Glasgow 2014 Commonwealth Games. *Annals of Leisure Research*, *18*(4), 450-469. https://doi.org/10.1080/11745398.2015.1045913

Misener, L., Taks, M., Chalip, L., & Green, B. C. (2015b). The elusive "trickle-down effect" of sport events: Assumptions and missed opportunities. *Managing Sport and Leisure*, *20*(2), 135-156. https://www.tandfonline.com/doi/full/10.1080/23750472.2015.1010278

Morgan, H. (2022). Conducting a qualitative document analysis. *The Qualitative Report, 27*(1), 64-77. https://doi.org/10.46743/2160-3715/2022.5044

Moriarty, S. E. (1983). Beyond the hierarchy of effects: A conceptual framework. *Current Issues and Research in Advertising*, *6*(1), 45-55. https://www.tandfonline.com/doi/abs/10.1080/01633392.1983.10505331

Müller, M., Wolfe, S. D., Gaffney, C., Gogishvili, D., Hug, M., & Leick, A. (2021). An evaluation of the sustainability of the Olympic Games. *Nature Sustainability*, *4*(4), 340-348. https://doi.org/10.1038/s41893-021-00696-5

Newig, J., Schulz, D., Fischer, D., Hetze, K., Laws, N., Lüdecke, G., & Rieckmann, M. (2013). Communication regarding sustainability: Conceptual perspectives and exploration of societal subsystems. *Sustainability*, *5*(7), 2976-2990. https://doi.org/10.3390/su5072976

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, *16*(1), 1609406917733847. https://doi.org/10.1177/1609406917733847

Paradis, K. F., Misener, L. J., McPherson, G., McGillivray, D., & Legg, D. (2017). Examining the impact of integrated and non-integrated parasport events on volunteer attitudes towards disability. *Sport in Society*, *20*(11), 1724-1744. https://doi.org/10.1080/17430437.2017.1329826

Parkin Hughes, C. (2017). *The conceptualisation of sustainability by tomorrow's managers.* University of Plymouth.

Perey, R. (2015). Making sense of sustainability through an individual interview narrative. *Culture and Organization*, *21*(2), 147-173. https://doi.org/10.1080/14759551.2013.819354

Pernecky, T. (2013). Events, society, and sustainability: Five propositions. In M. L. Tomas Pernecky (Ed.), *Events, society and sustainability: Critical and contemporary approaches* (pp. 33-47). Routledge.

Piggin, J., Souza, D. L. d., Furtado, S., Milanez, M., Cunha, G., Louzada, B. H., Graeff, B., & Tlili, H. (2019). Do the Olympic Games promote dietary health for spectators? An interdisciplinary study of health promotion through sport. *European Sport Management Quarterly*, *19*(4), 481-501. https://doi.org/10.1080/16184742.2018.1562484

Porter, T. B. (2008). Managerial applications of corporate social responsibility and systems thinking for achieving sustainability outcomes. *Systems Research and Behavioral Science*, *25*(3), 397-411. https://doi.org/10.1002/sres.902

Reid, A., & Petocz, P. (2006). University lecturers' understanding of sustainability. *Higher Education*, *51*(1), 105-123. https://doi.org/10.1007/s10734-004-6379-4

Reid, A., Petocz, P., & Taylor, P. (2009). Business students' conceptions of sustainability. *Sustainability*, *1*(3), 662-673. https://doi.org/10.3390/su1030662

Roy, D., Verplanken, B., & Griffin, C. (2015). Making sense of sustainability: Exploring the subjective meaning of sustainable consumption. *Applied Environmental Education & Communication*, *14*(3), 187-195. https://doi.org/10.1080/1533015X.2015.1067581

Santos, J. A. C., Fernández-Gámez, M. Á., Guevara-Plaza, A., Custódio Santos, M., & Pestana, M. H. (2023). The sustainable transformation of business events: Sociodemographic variables as determinants of attitudes towards sustainable academic conferences. *International Journal of Event and Festival Management*, *14*(1), 1-22. https://doi.org/10.1108/IJEFM-05-2022-0041

Schmidt, C. W. (2006). Putting the earth in play: Environmental awareness and sports. *Environmental Health Perspectives*, *114*(5), A286–A295. https://doi.org/10.1289/ehp.114-a286

Schulenkorf, N., Schlenker, K., Rammal, H., Peachey, J. W., & Morgan, A. (2022). *Managing and leveraging events: Business and social dimensions*. Routledge.

Simpson, B. J. K., & Radford, S. K. (2012). Consumer perceptions of sustainability: A free elicitation study. *Journal of Nonprofit & Public Sector Marketing*, *24*(4), 272-291. https://doi.org/10.1080/10495142.2012.733654

Smith, A. (2009). Theorising the relationship between major sport events and social sustainability. *Journal of Sport & Tourism*, *14*(2-3), 109-120. https://doi.org/10.1080/14775080902965033

Spence, M. (1973). Job market signaling. *The Quarterly Journal of Economics*, *87*(3), 355-374. https://doi.org/10.2307/1882010

Spradley, J. (1980). *Participant observation*. Wadsworth Inc Fulfillment.

Stahl, N. A., & King, J. R. (2020). Expanding approaches for research: Understanding and using trustworthiness in qualitative research. *Journal of Developmental Education*, *44*(1), 26-28. https://www.jstor.org/stable/45381095

Stake, R. (1995). *The art of case study research*. Sage.

Stake, R. (2005). Qualitative case studies. In N. D. Y. Lincoln (Ed.), *The Sage handbook of qualitative research*. Sage.

Swain, J., & King, B. (2022). Using informal conversations in qualitative research. *International Journal of Qualitative Methods*, *21*, 16094069221085056. https://doi.org/10.1177/16094069221085056

Taylor, S. E., & Crocker, J. (2022). Schematic bases of social information processing. In T. E. Higgins, P. C. Herman & M. P. Zanna (Eds.), *Social cognition*: *The Ontario Symposium, Volume 1* (pp. 89-134). Routledge.

Thomas, D. R. (2006). A general inductive approach for analyzing qualitative evaluation data. *American Journal of Evaluation*, *27*(2), 237-246. https://doi.org/10.1177/1098214005283748

Tight, M. (2022). Designing case studies. In U. Flick (Ed.), *The Sage handbook of qualitative research design* (pp. 399-413). Sage.

Tinnish, S. M., & Mangal, S. M. (2012). Sustainable event marketing in the MICE industry: A theoretical framework. *Journal of Convention & Event Tourism*, *13*(4), 227-249. https://doi.org/10.1080/15470148.2012.731850

Tölkes, C. (2018). Sustainability communication in tourism – A literature review. *Tourism Management Perspectives*, *27*, 10-21. https://doi.org/10.1016/j.tmp.2018.04.002

Tölkes, C. (2020). The role of sustainability communication in the attitude–behaviour gap of sustainable tourism. *Tourism and Hospitality Research*, *20*(1), 117-128. https://doi.org/10.1177/1467358418820085

Tölkes, C., & Butzmann, E. (2018). Motivating pro-sustainable behavior: The potential of green events – A case-study from the Munich Streetlife Festival. *Sustainability*, *10*(10), 3731. https://doi.org/10.3390/su10103731

Trail, G. (2015). Introduction to environmental sport management. In B. McCullough (Ed.), *Introduction to environmental sport management* (pp. 81-101). Forwarding Sport Sustainability.

Trail, G. (2016). *Marketing sustainability through sport*. Sport Consumer Research Consultants.

Trail, G. T., & McCullough, B. P. (2017). Marketing sustainability through sport: The importance of target market insights. In B. P. McCullough & T. B. Kellison (Eds.), *Routledge handbook of sport and the environment* (pp. 134-148). Routledge.

Trail, G. T., & McCullough, B. P. (2021). A longitudinal study of sustainability attitudes, intentions, and behaviors. *Sustainability Science*, *16*, 1503-1518. https://doi.org/10.1007/s11625-021-00954-7

Trendafilova, S., Pelcher, J., Graham, J., & Ziakas, V. (2021). The ebbs and flows of green waves: Environmental sustainability in Grand Slam tennis. *Sport, Business and Management: An International Journal, 11*(3), 302-320. https://doi.org/10.1108/SBM-09-2020-0090

Trendafilova, S., J. Ross, W., Triantafyllidis, S., & Pelcher, J. (2022). Tokyo 2020 Olympics sustainability: An elusive concept or reality? *International Review for*

the Sociology of Sport, *58*(3), 469-490. https://doi.org/10.1177/10126902221110157

United Nations. (2022). *Sport as an enabler of sustainable development: Resolution / adopted by the General Assembly*. https://digitallibrary.un.org/record/3997029

United Nations Framework Convention on Climate Change. (2015). *Sports for climate action framework*. https://unfccc.int/sites/default/files/resource/Sports_for_Climate_Action_Declaration_and_Framework.pdf

Waas, T., Hugé, J., Verbruggen, A., & Wright, T. (2011). Sustainable development: A bird's eye view. *Sustainability*, *3*(10), 1637-1661. https://doi.org/10.3390/su3101637

White, M. A. (2013). Sustainability: I know it when I see it. *Ecological Economics*, *86*, 213-217. https://doi.org/10.1016/j.ecolecon.2012.12.020

Whyte, P., & Lamberton, G. (2020). Conceptualising sustainability using a cognitive mapping method. *Sustainability*, *12*(5), 1977. https://doi.org/10.3390/su12051977

Wong, I. A., Wan, Y. K. P., Huang, G. I., & Qi, S. (2021). Green event directed pro-environmental behavior: An application of goal systems theory. *Journal of Sustainable Tourism*, *29*(11-12), 1948-1969. https://doi.org/10.1080/09669582.2020.1770770

World Commission on Environment and Development. (1987). *Report of the World Commission on Environment and Development: Our Common Future.* http://www.ask-force.org/web/Sustainability/Brundtland-Our-Common-Future-1987-2008.pdf

Yazan, B. (2015). Three approaches to case study methods in education: Yin, Merriam, and Stake. *The Qualitative Report*, *20*(2), 134-152. https://doi.org/10.46743/2160-3715/2015.2102

Table 1

Overview of Study Participants

Pseudonym	Age	Residence	Attended events	Locations
Filipa	31	Munich	Road cycling; Triathlon; BMX; Climbing; Roofs festival	City; Olympic Park; Königsplatz
Fabian	34	Munich	Rowing; 10k race; Roofs festival	Regattastrecke Oberschleißheim; Odeonsplatz
Marina	28	Munich	Mountain bike; Roofs festival	Olympic Park
Ivana	26	Munich	Beach volleyball	Königsplatz
Katharina	25	Munich	Gymnastics; Roofs festival	Olympic Park; Königsplatz
Joseph	26	Munich	Triathlon; Beach volleyball; Roofs festival	Olympic Park; Königsplatz
Julia	27	Munich	Table tennis; Athletics; Roofs festival	Audi Dome; Olympic Stadium; Olympic Park
Lukas	23	Munich	Gymnastics	Olympic Stadium
Sebastian	28	Munich	Athletics; Mountain bike; Beach volleyball, Canoe	Olympic Stadium; Odeonsplatz; Königsplatz; Regattastrecke Oberschleißheim
Saskia	25	Mainz	Athletics	Olympic Stadium
Chia-hao	26	Munich	Beach volleyball; Roofs festival; Table tennis	Königsplatz; Olympic Park; Audi Dome
Lina	30	Munich	Road cycling; Climbing	City; Königsplatz

Table 2

Interpreted Environmental Signals from Top-down and Bottom-up Perspectives

Signal	Top-down	Bottom-up
Facilities	Use of existing facilities Use of provisionally built facilities Use of facilities for multiple purposes	Use of existing facilities Use of provisionally built facilities Use of facilities for multiple purposes
Sustainable transportation	Multiple events in one place Accessibility by public transport Accessibility by bicycle Promotion and usage of sponsor's electro cars in logistics	Multiple events in one place Accessibility by public transport Accessibility by bicycle Promotion and usage of sponsor's electro cars in logistics
Clean environment	Waste separation system Digital access to information No excessive marketing materials Deposit system Mainly paper-based cutlery and plates for food Vegetarian food options[2]	Lack of waste separation system[1] Digital access to information No excessive marketing materials Deposit system Vegetarian food options
Procurement	Few merchandise products with a sustainability label Volunteers' equipment with a sustainable label Sustainably sourced giveaways	

Note. [1]Participants perceived a lack of sustainability effort. [2]The signal can also be categorised into 'health and sport promotion' (see Table 3) and 'clean environment'.

Table 3

Interpreted Social and Economic Signals from Top-down and Bottom-up Perspectives

Signal	Top-down	Bottom-up
Inclusion	Free entrance to events and festival	Free entrance to events and festival
	Volunteers with disabilities	Place of social encounter
	Inclusion-focused promotion stands	Inclusion-focused promotion stands
	Accessibility of facilities	
	Sign language interpretation	
	Parasport competitions	
	Para-athlete as ambassador	
Local value production	Locally sourced foods and drinks	
	Promotion stands for local businesses	
Health and sport promotion	Free physical activity opportunities	Use of competition facilities for visitors
	Use of competition facilities for visitors	Shared spaces with athletes
	Unhealthy and/or meat-heavy foods[1]	
	Promotion of local sports	
	Vegetarian food options	

Note. [1]Participants perceived a lack of sustainability effort even though they were aware of vegetarian food options (see Table 2).