Perceived risk-based sport spectator segmentation during the pandemic situation

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Abstract

Purpose – Although many attempts to discover key segments of sport spectators have been extant, little segmentation effort has been made to reflect pandemic situations such as the COVID-19 pandemic. The purpose of this research is twofold: (1) to classify sport spectators into key segments based on perceived risks associated with a mass-gathered sporting event during the COVID-19 pandemic and (2) to identify each segment’s profiles.

Design/methodology/approach – Questionnaire surveys of spectators attending a Japanese rugby game during the COVID-19 pandemic (January–June 2021) were conducted (n = 1,410). A combination of hierarchical and non-hierarchical clustering methods was executed.

Findings – The results revealed the five-cluster solution as the optimal number of clusters representing the samples (i.e. spectators with extremely low-risk perception, those with low-risk perception, those with moderate-risk perception, those with high-risk perception and those with higher social risk perception). This five-cluster solution showed sufficient stability and validity. Moreover, each segment had different profiles regarding three background aspects – demographics, psychographics and behavioral variables.

Originality/value – This study is the first effort to segment sport spectators based on perceived risks associated with a mass-gathered sporting event in the pandemic situation. Despite extensive segmentation studies to explore sport fans, contribution reflecting the post-crisis situations is scant. Therefore, the findings provide insight into this realm by providing a new viewpoint for understanding sport spectators during a possible future pandemic era.

Keywords Pandemic situations, Sport spectators, Mass gatherings, Perceived risks, Cluster analysis

Paper type Research paper

Introduction

Since the COVID-19 (coronavirus) pandemic began, the perceptions of attending a sporting event among spectators have changed drastically (Drury et al., 2021; Morton and Power, 2022; Vegara-Ferri et al., 2021). Fears of attending a mass-gathered sporting event became rampant due to the potential virus infection (McCloskey et al., 2020; Sato et al., 2022). For example, according to the national surveys on expectations toward sporting event organizers for re-opening a sporting event in Japan, those for avoiding “crowded places” and “close-contact settings” – two of the “Three Cs” recommended by the World Health Organization – showed a large increase of 7.4 and 9.7% in the past half year respectively (Sasakawa Sports Foundation, 2020). Although the situation of sport spectatorship returned to normal with COVID-19 vaccinations progressing, this phenomenon is likely to happen again during a possible future pandemic era (Reade et al., 2021; Reade and Singleton, 2021). Hence, a different perspective for...
understanding spectators is required in the post-pandemic era (Grix et al., 2021; Skinner and Smith, 2021).

Perceived risk is a central concept in explaining fears associated with mass gatherings during the pandemic situations (Chew and Jahari, 2014; Kinoshita and Matsuoka, 2022). Perceived risk refers to the perception of possible loss or harm due to uncertainty about consumption (Dowling and Staelin, 1994). It denotes the subjective anticipation of probable harm rather than the actual probability of negative outcomes (Reisinger and Mavondo, 2005). It is inextricably linked with the stimulation of anxiety among consumers at mass gatherings (Wolff et al., 2019). During the pandemic, perceived risks mainly occur in three forms: physical, psychological, and social risks (Matiza and Kruger, 2021). Individuals at mass gatherings perceive physical risks when their actions are expected to endanger their health (Yu et al., 2021). They sense psychological risks when their decision is believed to harm self-perception (Köchling et al., 2022). Social risks are perceived when their expected actions negatively impact their image (Sánchez-Cañizares et al., 2021).

There have been several attempts of segmentation to understand consumers during the pandemic based on perceived risks in the tourism literature (Jarumaneerat, 2022; Köchling et al., 2022; Matiza and Kruger, 2021). However, little effort has been made in the context of sport spectatorship. The aforementioned tourism studies highlighted specific tourist clusters depending on their perceived travel risks, providing a new understanding of tourists’ decision-making in the COVID-19 pandemic situation. Given the situation where risks associated with a mass-gathered sporting event have been a main interruption in spectators’ decision-making process (e.g. the average number of spectators per game in the 2021 season of the Japan Professional Football League [J. League] were more than three times lower than that in the 2019 season due to the COVID-19 pandemic; J. League, 2022) (Grix et al., 2021; Hindman et al., 2021), a perceived risk-based segmentation study can provide significant insights into the realm of sport spectatorship, especially during a possible future pandemic era. The COVID-19 pandemic may differ in its negative impacts on the social from a potential future pandemic. However, such a segmentation examination based on perceived risks and an effort to explore segments’ different profiles are expected to provide a fresh perspective on understanding spectators in a post-pandemic era that may arise in the future (Grix et al., 2021; Skinner and Smith, 2021). Therefore, the purpose of this research is twofold: (1) to classify sport spectators into key segments based on perceived risks associated with a mass-gathered sporting event during the COVID-19 pandemic and (2) to identify each segment’s profiles.

This study combined hierarchical and non-hierarchical clustering methods to complement each other (Hair et al., 2009). Data were collected at rugby stadiums in Japan because rugby is one of the most crowded events in Japan (e.g. 3,412 per game in the 2022 season). This study has two significant contributions. It is theoretically established based on the concept of perceived risks, prospect theory, and protection motivation theory. Perceived risks are a pivotal construct in understanding how fears associated with mass gatherings in post-pandemic situations interrupt consumers’ decision-making (Dowling and Staelin, 1994). Prospect theory explains an individual’s behaviors under uncertainty (Kahneman and Tversky, 1979), and thus is a central concept to comprehending sport spectators’ event attendance in uncertain circumstances such as the COVID-19 pandemic. Protection motivation theory is effective in grasping the backgrounds of different risk perceptions associated with a mass-gathered sporting event because it conceptualizes an individual’s protective behaviors in the presence of a threat stimulus (Rogers, 1975). For the above conceptual justification, these theoretical backgrounds extend prior literature. Moreover, despite extensive segmentation studies to explore sport fans (e.g. Alexandris and Tsiotsou, 2012; Uhrich et al., 2023), contribution reflecting the post-crisis situations is scant. Therefore, this study adds an insight into this realm by giving a new viewpoint for understanding spectators during a possible future pandemic era.
Theoretical background and literature review
Prospect theory and sport spectators during the pandemic situation
Prospect theory is key to understanding why sport spectators attend sporting events in uncertain circumstances such as the COVID-19 pandemic. According to prospect theory, an individual’s preferences and behaviors under risk and uncertainty follow the evaluation of potential gains and losses (Kahneman and Tversky, 1979). The theory hints at the roles of backgrounds in an individual’s decision-making under uncertainty (Sitkin and Pablo, 1992). The theory proposes that an individual holds different psychological accounts when assessing potential gains and losses (Lim and Noh, 2017). It implies that although the same amounts of losses exist in potential behaviors, different psychological effects occur depending on the perceptions of potential behaviors (Leung and Cai, 2021; Mao and Lyu, 2017).

In the context of sport spectatorship, gains possibly include well-being or happiness achieved from a spectating experience (e.g. Jang et al., 2017; Kim and James, 2019) and spectator motivations such as drama and escape (e.g. James et al., 2008; Trail and James, 2001). In contrast, losses are possibly related to risks associated with a mass-gathered sporting event due to the potential virus infection. Drawing on the prospect theory, sport spectators are likely to consider the beneficial effects of sport spectatorship (i.e. gains) and perceived risks at mass gatherings (i.e. losses) when deciding whether or not to attend a sporting event. For those who made an actual stadium attendance during the risky COVID-19 pandemic situation, it is assumed that potential gains outperformed potential losses. Thus, an understanding of these interactively influencing decision-making preferences is believed to be fundamental under the current pandemic situation.

Perceived risks of sport spectators during the pandemic situation
Perceived risks are a central construct in grasping sport spectators’ decision-making in post-pandemic situations (Kinoshita and Matsuoka, 2022). Risk refers to uncertainty and inherent consequences related to consumption (Bauer, 1967). It denotes the possibility of harm to individuals (Breakwell, 2014) and exposure to loss (Slovic, 1987). Accordingly, perceived risk is defined as the perception of possible loss or harm due to uncertainty about consumption (Dowling and Staelin, 1994). Risk consists of two dimensions: the likelihood and the consequence of a negative incidence (Breakwell, 2014). Its concept is associated with the amount of risk an individual perceives in a certain decision-making situation (Köchling et al., 2022). There are two perspectives on risk: objective (actual) and subjective (perceived) (Hansson, 2010). An objective risk indicates risks in gambling, where individuals make a choice between different outcomes (Kahneman and Tversky, 1979). In contrast, individuals view risks as unknown when lacking decision-making resources. This viewpoint focuses on individuals’ inferences, viewed as subjective (Reisinger and Mavondo, 2005). In the context of mass gathering, risk mainly denotes a subjective assessment of uncertainty (Quintal et al., 2010). Intangible, inseparable, and perishable natures of risks at mass gatherings make individuals’ decision-making susceptible to subjective risks (Karl and Schmude, 2017). They assess the severity of possible outcomes and integrate this self-styled information into subjective perceptions (Wolff and Larsen, 2017). Hence, perceived risks depend on intrinsic subjective biases informed by potential adverse consequences (Adam, 2015; Liu et al., 2016). Individuals primarily experience three dimensions of risk during pandemic situations such as the COVID-19 pandemic: physical, psychological, and social risks (Matiza and Kruger, 2021). Physical risks have to do with the health risks of getting infected (Peco-Torres et al., 2021; Yu et al., 2021). Psychological risks include feelings of anxiety and stress due to uncertainty caused by the pandemic (Köchling et al., 2022; Zheng et al., 2021). Social risks consist of the losses of social status in conjunction with their own decisions (Köchling et al., 2022; Sánchez-Cañizares et al., 2021).
Many studies to grasp perceived risks at mass gatherings during the pandemic have existed through several contexts: e.g. Karagöz et al. (2021) about tourists; Morton and Power (2022) about cultural festival participants; Kinoshita and Matsuoka (2022) about sport spectators; Westmattelmann et al. (2021) about sport participants. Market segmentation is an essential strategy applied to such efforts (Mullin et al., 2014). It is a marketing approach to profiling consumers into small homogenous segments based on four factors: geography, demography, behavior, and psychographics (Wedel and Kamakura, 2000). It is a useful strategy that helps marketers make more efficient decisions on allocating marketing resources (Uhrich et al., 2023). In line with this usefulness, several segmentation efforts have focused on perceived risks in the tourism literature (e.g. Köchling et al., 2022; Matiza and Kruger, 2021; see Appendix). They highlighted key tourist segments based on perceived travel risks (e.g. dogmatic, skeptical, and apprehensive tourists), offering new perspectives of comprehending tourists’ decision-making by reflecting on the pandemic era. Although many segmentation attempts have been extant in the context of sport spectatorship (e.g. Alexandris and Tsiotsou, 2012; Bouchet et al., 2011; see Appendix), little effort based on perceived attendance risks during the COVID-19 pandemic has been made. Given the situation where risks associated with a mass-gathered sporting event have disrupted spectators’ attendance intentions – for example, the Japan Professional Football League (J. League) has experienced a sharp decline of less than one-third in the number of spectators from the 2019 to 2021 season due to the COVID-19 pandemic – and the potential that such a situation could happen again during a possible future pandemic era (Grix et al., 2021; Hindman et al., 2021), a new attempt based on perceived risks is needed. Incorporating the above arguments, the following research question was developed:

RQ1. Based on perceived risks associated with a mass-gathered sporting event during the COVID-19 pandemic, what key segments are sport spectators classified into?

Protection motivation theory and cluster analysis of sport spectators during the pandemic situation

Protection motivation theory (PMT) can be effective in studying backgrounds of different risk perceptions associated with a mass-gathered sporting event. Protection motivation refers to an individual’s intention to adopt recommended behaviors to protect him/herself against a threat (Lwin et al., 2010). PMT conceptualizes an individual’s motivation to participate in protective behaviors in the presence of a threat (Rogers, 1975). According to PMT, the decision on whether to engage in protective behaviors is made by two cognitive processes – threat and coping appraisal (Rogers, 1983). Threat appraisal is an individual’s process to assess the level of a threat (Rogers, 1975). It includes threat vulnerability and threat severity (Rippetoe and Rogers, 1987). Threat severity denotes the perceived seriousness of a potential threat, while threat vulnerability reveals the perceived probability of a potential threat to happen (Rogers, 1975). High threat severity and vulnerability perceptions bring about risk-preventative behaviors (Rippetoe and Rogers, 1987). Coping appraisal indicates an individual’s ability to perform protective behaviors in the presence of a threat (Rogers, 1975), including response efficacy, self-efficacy, and response cost (Rogers, 1983; Rogers and Prentice-Dunn, 1997). Response efficacy refers to the perceived effectiveness of recommended risk-preventative behaviors, while self-efficacy denotes the perceived ability to control a threat (Floyd et al., 2000). Response cost reveals the perceived costs associated with an action (Rogers, 1983). An individual tends to carry out adaptive actions if he/she feels capable of coping with a threat. When an individual feels incapable of doing it, maladaptive actions are taken to minimize the treat (Rippetoe and Rogers, 1987). These two appraisal processes sequentially occur (Arthur and Quester, 2004). An individual first conducts threat appraisal. Then, fears are activated based on the perceived probability and severity of threats. Upon the emotion of fears, he/she in turn undertakes coping
Based on the above explanation of dual protection motivation processes, the use of PMT has been shown in many studies on grasping consumer behavior during the pandemic situation: e.g. the 2009 H1N1 pandemic (Cho and Lee, 2015; Prati et al., 2011), the COVID-19 pandemic (Kim et al., 2022; Rather, 2021; Takamatsu, 2022; Zheng et al., 2021).

Based on the concept of PMT, individuals considering whether to attend a sporting event during the COVID-19 situation are expected to estimate both the possibility/severity of potential virus infection (i.e. threat appraisal) and their coping ability (i.e. coping appraisal). According to previous research (e.g. Jarumaneerat, 2022; Kim et al., 2022; Matiza and Kruger, 2021), these two appraisal processes primarily depend on individuals’ backgrounds (e.g. demographic, psychographic, and behavioral characteristics). For example, the segment with a higher perception of threat appraisal showed the tendency of including those older or more females than the opposite one (Matiza and Kruger, 2021). On the contrary, it was demonstrated that those who have more past experience or a high coping ability reported a less perception of threat appraisal (Jarumaneerat, 2022). Incorporating the above findings, a great possibility that each key sport spectator segment has different backgrounds can be suggested, which prompted the following research question:

RQ2. What different profiles does each perceived risk-based sport spectator segment have?

Methods
Data collection and participants
Data were collected using a questionnaire survey at four rugby stadiums in Japan during the COVID-19 pandemic (January–June 2021: games held on January 11, May 8, May 23, and June 12). Rugby is one of the most crowded sporting events in Japan, and its league is one of those that formulate strict guidelines to prevent the potential COVID-19 infection, thus being considered appropriate for understanding sport spectators’ perceived risks when attending a sporting event during the COVID-19 pandemic situation. The face-to-face survey was conducted before the game began. Purposive sampling was employed, with careful consideration of gender and age. Well-trained surveyors visited the seating sections and asked spectators to answer a questionnaire. Only those who agreed to answer the questionnaire and said that they were the first to answer the questionnaire that day were distributed, and no compensation for survey participation was given. They were asked to answer questions on three dimensions of perceived risk (i.e. physical, psychological, and social risks), demographics (e.g. gender, age, and residence prefecture), psychographics (i.e. rugby fandom and perceived value of ticket price), and behavioral items (e.g. rugby fan history, rugby spectating experience, and time from home to the stadium). The collection of the answered surveys was performed before the beginning of the game at three stadiums but after the game by mail at one stadium. The collected data were password protected. Respondents’ perceptions might differ depending on when the data was collected. Thus, three dimensions of perceived risk were compared among respondents at four stadiums in the following section of the results. A total of 1,410 samples who answered all the questions were employed for cluster analyses (a response rate of 65.5%; see Table 1 for demographics).

Measurements
Each dimension of perceived risks was measured through two items, adopted from Peco-Torres et al. (2021) for physical risks, Matiza and Kruger (2021) for psychological risks and social risks. Those items were modified for this research context and were rated on a 7-point Likert scale from 1 = strongly disagree to 7 = strongly agree (see Table 2).
Regarding demographics, nine variables including gender, age, job, marriage status, annual household income, experience playing rugby, current involvement in rugby, the average number of COVID-19 cases in the residence prefecture per day until the survey (per million population), and the residence prefecture status of non-pharmaceutical interventions against COVID-19 at the time of the survey were used. Data on the number of COVID-19 cases in the residence prefecture per day until the survey were
gathered from the website on the transition of COVID-19 cases that was announced by Sapporo Medical University School of Medicine (https://web.sapmed.ac.jp/canmol/coronavirus/index_e.html). This website presents the number of COVID-19 cases and deaths per million population over time based on the European Centre for Disease Prevention and Control, World Health Organization situation reports, and population data of the United Nations. It is the only website that offers the data by prefecture in Japan. It has also been cited in many scientific research papers (e.g., Aizawa et al., 2021; Delatorre et al., 2020; Idogawa et al., 2020). Thus, the authors decided to use the data from this website.

Rugby fandom, rated on a 5-point Likert scale from 1 = strongly disagree to 5 = strongly agree, and perceived value of ticket price, assessed on a 5-point Likert scale from 1 = expensive to 5 = inexpensive, were employed as psychographics. Regarding behavioral items, five variables were used on rugby fan history, rugby spectating experience, time from home to the stadium, companion during the attendance, and ticket purchasing.

Data analyses
A confirmatory factor analysis for three factors of perceived risks was conducted before clustering analyses. Then, two clustering methods – hierarchical and non-hierarchical – were combined to find key spectator segments (Research question 1). In the first step, a hierarchical cluster analysis was carried out with Ward’s method based on squared Euclidian distances to determine the optimal number of clusters within the samples. Ward’s method is a common approach to minimizing the within-cluster variance (Hair et al., 2009). The analysis was performed according to the guidelines proposed by Romesburg (1984). Each sample started out as its cluster, and then the closest ones were integrated into a new aggregate cluster. This process continued until a single homogeneous cluster was confirmed. In the second step, the initial cluster centers extracted by Ward’s method were used as non-random starting points in a non-hierarchical K-means clustering method (Vansteenkiste et al., 2009). During this step, a cluster seed was chosen as the initial cluster center. All samples with a specific threshold distance were included in the resulting cluster. Another seed was chosen, and this process continued until all samples were assigned (Fortunato and Goldblatt, 2006). Hence, as opposed to a hierarchical cluster analysis representing a means of obtaining the optimal number of clusters, a non-hierarchical k-means cluster analysis is a method of further fine-tuning the preliminary cluster solution through an iterative process (Gore, 2000). Once the clusters were identified through a series of the two clustering methods, Chi-square tests for qualitative variables and the multivariate analysis of variance (MANOVA) for continuous variables were performed to compare characteristics among the clusters (Research question 2).

Results
Measurement model
A confirmatory factor analysis was performed. The model fit showed acceptable levels for all indices ($\chi^2/df = 3.446 \text{ [<5.000]}, \text{TLI} = 0.991 \text{ [>0.900]}, \text{CFI} = 0.997 \text{ [>0.900]}, \text{RMSEA} = 0.042 \text{ [<0.080]}, \text{SRMR} = 0.010 \text{ [<0.080]}$; Bollen, 1989; Hair et al., 2009; Hu and Bentler, 1999). The standardized factor loadings of all items were statistically significant and ranged from 0.63 to 0.92, surpassing the cut-off point of 0.50 (Hair et al., 2009, Table 2). The CR values ranged from 0.71 to 0.85, indicating acceptable levels of reliability for the variables according to the recommended 0.60 threshold (Bagozzi and Yi, 1988). The AVE values were greater than the 0.50 standard for convergent validity (Fornell and Larcker, 1981), ranging from 0.56 to 0.74. The variables showed acceptable levels of convergent validity. The AVE for each variable was also greater than the squared correlations with other variables (physical
risk-psychological risk: 0.40; physical risk-social risk: 0.35; psychological risk-social risk: 0.39), supporting the discriminant validity (Fornell and Larcker, 1981). Therefore, the measurement model was successfully fitted to the data.

**Comparison of perceived risks among four stadiums**

To examine whether respondents’ perceived risks differed depending on the time of data collection, three dimensions of perceived risk were compared among four stadiums. As a result of MANOVA, although respondents at the stadium where the data collection was conducted after the game by mail showed a higher degree of three perceived risks than those at several stadiums (physical risk: $F[3,1406] = 12.94, p < 0.001$; psychological risk: $F[3,1406] = 9.57, p < 0.001$; social risk: $F[3,1406] = 15.09, p < 0.001$), they did not report an extremely high or low degree regarding all of three perceived risks (see Table 3). Therefore, the authors concluded that the data collection time was insignificant in determining respondents’ perceived risks.

**Cluster classification and labels**

As a result of the hierarchical cluster analysis using Ward’s method, both dendrogram and agglomeration coefficients identified the five-cluster solution as the optimal number of clusters representing samples. Then, according to this five-cluster solution, the non-hierarchical K-means clustering method was performed to assign the samples to five clusters for further analyses. The results of the five-cluster solution revealed 24.3% of the total samples for Cluster 1 ($n = 342$), 20.4% for Cluster 2 ($n = 287$), 31.1% for Cluster 3 ($n = 438$), 11.6% for Cluster 4 ($n = 163$), and 12.8% for Cluster 5 ($n = 180$). Regarding the comparisons of perceived risks among clusters, all the comparisons were statistically significant ($p < 0.001$) except for that of social risk between Cluster 3 and Cluster 5 ($p = 0.10$). Cluster 1 was labeled as “spectators with extremely low-risk perception” because they showed an extremely low perception of three risks under two points of a 7-point Likert scale (physical risk: $M = 1.68, SD = 0.63$; psychological risk: $M = 1.58, SD = 0.74$; social risk: $M = 1.70, SD = 0.67$; see Figure 1). Cluster 2, Cluster 3, and Cluster 4 were labeled as “spectators with low-risk perception”, “spectators with moderate-risk perception”, and “spectators with high-risk perception”, respectively, based on their perceived risk levels. Cluster 5 exhibited a comparatively higher social risk perception than other risks (physical risk: $M = 2.09, SD = 0.80$; psychological risk: $M = 2.32, SD = 1.02$; social risk: $M = 4.48, SD = 0.77$), promoting the label “spectators with higher social risk perception”.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Japan National Stadium (i) $M$ (SD)</th>
<th>Egao Kenko Stadium (ii) $M$ (SD)</th>
<th>Prince Chichibu Memorial Rugby Stadium (iii) $M$ (SD)</th>
<th>Shizuoka Stadium Ecopa (iv) $M$ (SD)</th>
<th>$F$-value</th>
<th>Post hoc tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical risk</td>
<td>3.31 (1.30)</td>
<td>3.10 (1.23)</td>
<td>2.72 (1.25)</td>
<td>3.20 (1.35)</td>
<td>12.94***</td>
<td>i, iv &gt; iii***; ii &gt; iii***; iv &gt; iii***</td>
</tr>
<tr>
<td>Psychological risk</td>
<td>3.11 (1.46)</td>
<td>3.31 (1.50)</td>
<td>2.84 (1.40)</td>
<td>3.40 (1.58)</td>
<td>9.57***</td>
<td>ii &gt; iii***; iv &gt; i; iv &gt; iii***</td>
</tr>
<tr>
<td>Social risk</td>
<td>3.85 (1.47)</td>
<td>3.50 (1.45)</td>
<td>3.14 (1.45)</td>
<td>3.74 (1.54)</td>
<td>15.09***</td>
<td>i, iv &gt; iii***; i &gt; ii*; ii &gt; iii*</td>
</tr>
</tbody>
</table>

**Table 3.** Comparisons of perceived risks among four stadiums

**Note(s):** *p < 0.05, ***p < 0.01, ****p < 0.001

**Source(s):** Authors’ own creation
Cluster solution validation

The stability and validity of the cluster solution were tested. First, the stability of the cluster solution was assessed by randomly splitting the dataset into two subsamples and comparing centroids of three perceived risks between the two subsamples within each cluster. The high stability of the cluster solution can be supported when there is no significant difference in compared variables between two subsamples (Sarstedt and Mooi, 2014). The t-test results revealed no significant difference between three perceived risks of two subsamples in five clusters (see Table 4). Therefore, the existence of high cluster stability was supported.

Second, the validity of the cluster solution was investigated. It can be verified when clusters have meaningful interpretations by testing the differences in important variables between the clusters (Clatworthy et al., 2005). For this testing, three dimensions of perceived risk were compared among the five clusters. The results of MANOVA indicated that the five clusters significantly differed regarding three perceived risks ($p < 0.001$) except for a comparison of social risk between Cluster 3 and Cluster 5 ($p = 0.10$), as revealed in the results of the cluster classification. Although there was a non-significant difference in the comparison, the results demonstrate a sufficient validity of the cluster solution given the many numbers of clusters in this study. Considered together, the stability and validity of the cluster solution were supported.

Cluster profiling

Cluster 1 ($n = 342$; 24.3%) represents the segment of spectators with extremely low-risk perception. This cluster included the most males (68.4%) and the highest average-aged spectators (49.51) (see Table 5). They lived in the prefectures where the higher average number of COVID-19 cases per day until the survey existed (13.57 per million population), and their residences were experiencing non-pharmaceutical interventions at a higher rate (76.0%) at the time of the survey. In terms of psychographics, they perceived a higher value

Note(s): Physical risk: $F(4,1405) = 720.69, p < 0.001$; Psychological risk: $F(4,1405) = 939.81, p < 0.001$; Social risk: $F(4,1405) = 1188.27, p < 0.001$

Source(s): Authors’ own creation
Table 4. Comparisons of perceived risks between two randomly generated subsamples

<table>
<thead>
<tr>
<th>Cluster 1&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Cluster 2&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Cluster 3&lt;sup&gt;3&lt;/sup&gt;</th>
<th>Cluster 4&lt;sup&gt;4&lt;/sup&gt;</th>
<th>Cluster 5&lt;sup&gt;5&lt;/sup&gt;</th>
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<tbody>
<tr>
<td></td>
<td>Subsample 1 M (SD)</td>
<td>Subsample 2 M (SD)</td>
<td>Subsample 1 M (SD)</td>
<td>Subsample 2 M (SD)</td>
</tr>
<tr>
<td>Physical risk&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.70 (0.65)</td>
<td>1.65 (0.62)</td>
<td>3.40 (0.80)</td>
<td>3.32 (0.67)</td>
</tr>
<tr>
<td>Psychological risk&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.59 (0.76)</td>
<td>1.56 (0.72)</td>
<td>2.75 (0.78)</td>
<td>2.85 (0.75)</td>
</tr>
<tr>
<td>Social risk&lt;sup&gt;c&lt;/sup&gt;</td>
<td>1.63 (0.65)</td>
<td>1.77 (0.68)</td>
<td>3.01 (0.77)</td>
<td>2.94 (0.73)</td>
</tr>
</tbody>
</table>

Note(s):<sup>1</sup>-<sup>a</sup>: t(340) = 0.71, p = 0.48;<sup>1</sup>-<sup>b</sup>: t(340) = 0.30, p = 0.77;<sup>1</sup>-<sup>c</sup>: t(340) = 1.93, p = 0.06;<sup>2</sup>-<sup>a</sup>: t(268.136) = 0.95, p = 0.35;<sup>2</sup>-<sup>b</sup>: t(285) = 1.10, p = 0.27;<sup>2</sup>-<sup>c</sup>: t(285) = 0.73, p = 0.47;<sup>3</sup>-<sup>a</sup>: t(436) = 0.09, p = 0.93;<sup>3</sup>-<sup>b</sup>: t(436) = 0.20, p = 0.84;<sup>3</sup>-<sup>c</sup>: t(436) = 0.76, p = 0.45;<sup>4</sup>-<sup>a</sup>: t(161) = 1.75, p = 0.08;<sup>4</sup>-<sup>b</sup>: t(161) = 0.32, p = 0.75;<sup>4</sup>-<sup>c</sup>: t(161) = 1.14, p = 0.26;<sup>5</sup>-<sup>a</sup>: t(178) = 0.49, p = 0.62;<sup>5</sup>-<sup>b</sup>: t(178) = 1.44, p = 0.15;<sup>5</sup>-<sup>c</sup>: t(178) = 0.46, p = 0.65

Source(s): Authors’ own creation
<table>
<thead>
<tr>
<th>Variables</th>
<th>Cluster 1 Spectators with extremely low-risk perception (n = 342)</th>
<th>Cluster 2 Spectators with low-risk perception (n = 287)</th>
<th>Cluster 3 Spectators with moderate-risk perception (n = 438)</th>
<th>Cluster 4 Spectators with high-risk perception (n = 163)</th>
<th>Cluster 5 Spectators with higher social risk perception (n = 180)</th>
<th>( \chi^2 ) / F-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics</td>
<td></td>
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<td></td>
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<tr>
<td>Gender (% of Male)</td>
<td>68.4</td>
<td>64.5</td>
<td>63.9</td>
<td>55.2</td>
<td>58.3</td>
<td>10.61*</td>
</tr>
<tr>
<td>Age</td>
<td>49.51 (±12.21)</td>
<td>49.46 (±12.62)</td>
<td>48.61 (±10.45)</td>
<td>46.04 (±11.71)</td>
<td>47.68 (±10.57)</td>
<td>3.23*</td>
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<tr>
<td>Job (%)</td>
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<td></td>
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<tr>
<td>Full-time job</td>
<td>82.2</td>
<td>77.4</td>
<td>80.6</td>
<td>82.2</td>
<td>86.1</td>
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<td>Part-time job</td>
<td>9.9</td>
<td>12.5</td>
<td>13.2</td>
<td>8.0</td>
<td>8.3</td>
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<tr>
<td>Student</td>
<td>4.1</td>
<td>4.9</td>
<td>2.1</td>
<td>6.1</td>
<td>3.3</td>
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<tr>
<td>No job</td>
<td>2.3</td>
<td>3.8</td>
<td>2.5</td>
<td>2.5</td>
<td>1.7</td>
<td></td>
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<tr>
<td>Others</td>
<td>1.5</td>
<td>1.4</td>
<td>1.6</td>
<td>1.2</td>
<td>0.6</td>
<td></td>
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<tr>
<td>Marriage (% of Yes)</td>
<td>72.2</td>
<td>67.2</td>
<td>72.4</td>
<td>62.0</td>
<td>68.9</td>
<td>8.00</td>
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<tr>
<td>Annual household income (%)</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>~5,999,999 Japanese yen</td>
<td>32.2</td>
<td>33.8</td>
<td>35.2</td>
<td>41.1</td>
<td>23.3</td>
<td>17.82*</td>
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<tr>
<td>6,000,000~11,999,999 Japanese yen</td>
<td>43.9</td>
<td>46.7</td>
<td>44.7</td>
<td>44.8</td>
<td>53.9</td>
<td></td>
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<tr>
<td>12,000,000 Japanese yen~</td>
<td>24.0</td>
<td>19.5</td>
<td>20.1</td>
<td>14.1</td>
<td>22.8</td>
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<tr>
<td>Experience playing rugby (% of Yes)</td>
<td>26.3</td>
<td>23.7</td>
<td>26.9</td>
<td>20.9</td>
<td>22.8</td>
<td>3.42</td>
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<tr>
<td>Current involvement in rugby (% of Yes)</td>
<td>16.1</td>
<td>11.8</td>
<td>13.5</td>
<td>17.8</td>
<td>13.9</td>
<td>4.18</td>
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<tr>
<td>Average number of COVID-19 cases in the residence prefecture per day until the survey (per million population)</td>
<td>13.57 (±6.31)</td>
<td>13.19 (±6.25)</td>
<td>12.16 (±6.11)</td>
<td>11.66 (±6.08)</td>
<td>13.84 (±6.13)</td>
<td>5.41***</td>
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<tr>
<td>Residence prefecture status of non-pharmaceutical interventions at the time of the survey (% of Yes)</td>
<td>76.0</td>
<td>76.7</td>
<td>72.1</td>
<td>69.3</td>
<td>81.7</td>
<td>9.54*</td>
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(continued)
### Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Cluster 1 Spectators with extremely low-risk perception (n = 342)</th>
<th>Cluster 2 Spectators with low-risk perception (n = 287)</th>
<th>Cluster 3 Spectators with moderate-risk perception (n = 438)</th>
<th>Cluster 4 Spectators with high-risk perception (n = 163)</th>
<th>Cluster 5 Spectators with higher social risk perception (n = 180)</th>
<th>( \chi^2 ) / F-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychographics</td>
<td></td>
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<tr>
<td>Rugby fandom</td>
<td>4.63 (±0.64)</td>
<td>4.57 (±0.59)</td>
<td>4.53 (±0.61)</td>
<td>4.60 (±0.66)</td>
<td>4.69 (±0.55)</td>
<td>2.77*</td>
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<tr>
<td>Perceived value of ticket price</td>
<td>2.81 (±0.94)</td>
<td>2.76 (±0.87)</td>
<td>2.72 (±0.86)</td>
<td>2.54 (±1.03)</td>
<td>2.82 (±1.01)</td>
<td>2.74*</td>
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<td>Behavioral variables</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Rugby spectating experience for the past year (% of Yes)</td>
<td>77.5</td>
<td>74.9</td>
<td>70.1</td>
<td>69.9</td>
<td>70.6</td>
<td>7.20</td>
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<tr>
<td>Time from home to the stadium (minutes)</td>
<td>102.56 (±83.20)</td>
<td>107.43 (±90.15)</td>
<td>108.89 (±82.61)</td>
<td>131.42 (±89.36)</td>
<td>116.08 (±86.24)</td>
<td>3.34**</td>
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<tr>
<td>Companion during the attendance (% of Yes)</td>
<td>19.3</td>
<td>18.5</td>
<td>18.0</td>
<td>20.2</td>
<td>17.8</td>
<td>0.57</td>
</tr>
<tr>
<td>Ticket purchasing (% of Yes)</td>
<td>90.1</td>
<td>94.1</td>
<td>93.4</td>
<td>96.9</td>
<td>95.6</td>
<td>11.07*</td>
</tr>
</tbody>
</table>

**Note(s):** *p < 0.05, **p < 0.01, ***p < 0.001  
**Source(s):** Authors' own creation
of ticket price (2.81). Regarding behavioral variables, they were rugby fans from the oldest period, since 1998, and their residences were the closest to the stadium (102.56 min). They had the lowest percentage of ticket purchasing (90.1%).

Cluster 2 \( (n = 287; 20.4\%) \) is the segment of spectators with low-risk perception. This segment contained a comparatively higher proportion of males (64.5%), but lower than Cluster 1. The average age of the spectators was 49.46 years old, similar to Cluster 1. Their residence prefectures had a 13.19 per million population as the average number of COVID-19 cases per day until the survey, lower than Cluster 1, and showed a higher percentage of experiencing non-pharmaceutical interventions (76.7%) at the time of the survey. Their residences were relatively close to the stadium (107.43 min).

Cluster 3, labeled as “spectators with moderate-risk perception” indicated the largest proportion of 31.1\% \( (n = 438) \). The percentage of males (63.9%) and their average age (48.61) were between Cluster 2 and Cluster 4. Regarding the average number of COVID-19 cases in the residence prefectures per day until the survey (12.16 per million population) and the status of non-pharmaceutical interventions in the residence prefectures at the time of the survey (72.1% was experiencing), this cluster also showed between Cluster 2 and Cluster 4. This cluster had the lowest degree of rugby fandom (4.53). The time from the home to the stadium showed lower minutes (108.89).

Cluster 4 \( (n = 163; 11.6\%) \) indicates the segment of spectators with high-risk perception. This cluster included the lowest proportion of males among the five clusters (55.2%) and the youngest spectators, with a 46.04 average age. Their annual household income showed the highest percentage, 41.1%, of the lowest income category (\( \sim 5,999,999 \) Japanese yen). The average number of COVID-19 cases in their residence prefectures per day until the survey was the lowest (11.66 per million population), and their residence prefectures were experiencing non-pharmaceutical interventions at the lowest rate (69.3%) at the time of the survey. Regarding psychographics, they perceived the lowest value of ticket price among the five clusters (2.54). In terms of behavioral items, they were the comparatively newest rugby fans, among others, since 2002.69, and their residences were the farthest from the stadium (131.42 min). Their ticket purchasing rates showed the highest at 96.9%.

Cluster 5 \( (n = 180; 12.8\%) \) is labeled as “spectators with higher social risk perception”. The percentage of males (58.3%) and their average age (47.68) were between Cluster 3 and Cluster 4. This cluster contained the lowest percentage, 23.3%, of the lowest income category. Similar to Cluster 1, they lived in the prefectures where the higher average number of COVID-19 cases per day until the survey existed (13.84 per million population), and their residences were experiencing non-pharmaceutical interventions at the highest rate, 81.7%, at the time of the survey. Their rugby fandom (4.69) and their perceived value of ticket price (2.82) were at the highest level. Regarding behavioral items, the percentage of their ticket purchasing was at a comparatively higher rate of 95.6%.

Discussion

Theoretical implications

The current study is the first effort to segment sport spectators based on perceived risks associated with a mass-gathered sporting event during pandemic situations. Given that the worldwide hyper-transmissibility of the COVID-19 virus has drastically changed the perceptions of attending a mass-gathered sporting event, our findings are expected to add significant insights to the field of sport spectatorship in a possible future pandemic era. Perceived risks at mass gatherings have been explored through other research fields, such as tourism and event management, which demonstrate that perceived risks are a central construct in grasping consumers’ decision-making in times of the pandemic (e.g. Karagöz et al., 2021; Morton and Power, 2022; Neuburger and Egger, 2021). These pieces of evidence
imply that a new attempt to understand perceived risks during the pandemic situation in the context of sport spectatorship can also produce significant contributions. Several tourism studies highlighted key tourist segments, such as dogmatic, skeptical, and apprehensive tourists, based on perceived travel risks (e.g. Köchling et al., 2022; Matiza and Kruger, 2021). Their efforts provide new perspectives on comprehending tourists’ decision-making in the post-pandemic era. Accordingly, this study, as the first attempt to segment sport spectators based on perceived risks at a mass-gathered sporting event, can add notable insights to the realm of sport spectatorship by providing a new viewpoint for understanding spectators in the pandemic era. Five key clusters based on perceived attendance risks were identified (i.e. Research question 1). Each cluster showed different perceptions of three perceived risks (i.e. Research question 2). Because these results reflect the current pandemic situation, this study can significantly extend the existing segmentation studies. Moreover, it contributes to the prospect theory in that a new perspective for understanding sport spectators’ behaviors under uncertain circumstances, such as the COVID-19 pandemic, was suggested by this study.

The findings of five clusters having different profiles demonstrate that the segmentation depends on consumers’ backgrounds. These align with the protection motivation theory (PMT) concept. Individuals tend to engage in protective behaviors through two cognitive processes – threat and coping appraisal (Rogers, 1983). These two appraisal processes are primarily determined by individuals’ backgrounds (Jarumaneerat, 2022; Kim et al., 2022; Matiza and Kruger, 2021). Our results highlighted five unique profiles based on three background aspects – demographics, psychographics, and behavioral variables. For example, “spectators with extremely low-risk perception (Cluster 1)” were found to live in the prefectures where a higher average number of COVID-19 cases per day until the survey existed than the residence prefectures of “spectators with moderate-risk perception (Cluster 3)” and “spectators with high-risk perception (Cluster 4)”. These results reveal the opposite relationships between spectators’ risk perceptions and the COVID-19 cases surrounding them. This assumption can happen that because those who live in the prefectures with the higher average number of COVID-19 cases are already used to seeing COVID-19 cases in their daily, their risk perceptions might have been relatively low. This can be explained by threat severity – the perceived seriousness of a potential threat – one of the threat appraisals.

Furthermore, “spectators with extremely low-risk perception (Cluster 1)” showed the highest rugby spectating experience for the past year. Through such experiences during the COVID-19 pandemic, they might have been given the ability to control perceived risks by recognizing effective risk-preventative behaviors at the stadium. This interpretation may relate to coping appraisal, such as self-efficacy and response efficacy. On the other hand, “spectators with higher social risk perception (Cluster 5)” who exhibited a comparatively higher social risk perception than other risks lived in the prefectures with the high average number of COVID-19 cases as the residence prefectures of Cluster 1 had. Cluster 5’s residences experienced non-pharmaceutical interventions at the highest rate at the time of the survey. Thus, it can be assumed that the atmosphere was such that people refrained from going out, leading to higher perceptions of social risks. Additionally, according to the theory of normative social behavior (Rimal and Real, 2005), individuals tend to practice preventative behaviors depending on perceived social norms. Social norms are defined as ‘rules and standards that are understood by members of a group, and that guide or constrain social behavior without the force of law (Cialdini and Trost, 1998, p. 152).’ During non-pharmaceutical interventions, not avoiding “Three Cs” (e.g. attending a sporting event) would be against the social norms. In prefectures with a high number of COVID-19 cases, it can be speculated that there are some spectators who perceive higher social norms although they are already used to seeing COVID-19 cases in their daily life as Cluster 5. In contrast, there are some who have relatively lower risk perceptions associated with a mass-gathered
sporting event because they are already used to seeing COVID-19 cases in their daily life as Cluster 1. This speculation is limited because the present study did not measure the perception of social norms. Nevertheless, a great possibility that each key sport spectator segment has different backgrounds can be supported by our findings, and this possibility extends the concept of PMT.

Managerial implications
The authors can suggest marketing strategies for spectator segments based on their perceived risks and background characteristics. For the segment that highly perceives three dimensions of risk, marketing promotions requiring “close-contact settings” or those using reusable items may bring about unpleasant feelings. Although they were real spectators despite their high-risk perceptions, such promotions can damage their future attendance intentions. Especially, it can be true, considering the cluster profiling results that the segment with high-risk perceptions evaluated the lowest value of ticket price compared to others. This segment included more females, the youngest spectators, and those who lived in the residence prefectures with the lowest average number of COVID-19 cases per day until the survey. For example, because younger generations tend to be more familiar with using a social media, a social media channel where they can share their reactions while watching a game at the stadium with others using their smartphones can be helpful for the teams to increase the connection between spectators during the game and avoid “close-contact settings”. Moreover, the teams or event organizers tend to use reusable items for managerial reasons during the event; thus, a thorough plan is required for this segment.

In contrast, the segment who have low risk perceptions are expected to be less sensitive to avoiding “Three Cs”, and thus marketing activities that are less restricted to avoid such “Three Cs” can be applicable. In this research, spectators who lowly perceived risks associated with a mass-gathered sporting event were relatively older and their rugby fan histories were longer than others. However, their ticket purchasing rates were comparatively low. An appropriate understanding of targets’ behavioral tendencies, as well as demographic information, is required for marketers. For example, because they have engaged in rugby for a long time, the marketing activities to utilize their effectiveness to others would be helpful for maintaining their intention to visit a match and creating others’ desire to attend a game.

Additionally, the segment with the highest percentage was the spectators with moderate-risk perceptions (31.1%). It is surprising considering the current situation where fears at mass gatherings have been rampant due to the potential virus infection. Marketers might not be so limited in developing marketing strategies even under the post-crisis situations. This interpretation can help marketers who work toward more efficient allocation of their marketing resources. Lastly, for the segment that highly perceives a social risk, promotions that show how well sporting events are managed with appropriate measures against the virus infection can be useful. Such marketing promotions can change negative perceptions of individuals attending a mass-gathered sporting event, or at least, they can be less concerned about others’ eyes when they realize that the event is thoroughly managed to avoid “Three Cs”. Therefore, marketers must consider changing social perceptions of attending mass-gatherings during their event management and reducing the potential virus infection.

Limitations and future research
Although this study can help to identify key sport spectators’ segments based on perceived risks during pandemic situations, it also has several limitations. During data collection, questionnaires were not distributed to the spectators who arrived in the stadium within 15 min before the game began. Because the authors believed that respondents should be
given enough time to complete the questionnaire, such spectators were excluded from data collection. It was also true that the questionnaires had to be collected in a way that would at least not disrupt customers from watching the game. This is one of the limitations because respondent bias occurred.

The findings might not be generalizable to other sporting events. Although the data collection was conducted in several stadiums, using rugby matches alone for the data collection may run the risk of overgeneralizing. If future research aims to understand general trends or principles in sports audience segmentation, it is recommended to consider that the data collection is conducted over various sporting events. Moreover, it would be interesting for future studies to consider using a longitudinal study design to examine behavior changes over time because the pandemic situation lasts for a while. Perceived risks can be linked to cultural characteristics. Spectators from Western cultures may perceive the risks associated with a mass-gathered sporting event during the pandemic situations differently. From a theoretical perspective, an examination of whether or not, and if so, how perceived risks depend on cultural backgrounds would be an interesting task for future research.

Other psychographic variables can be included in the profiling factors. For example, if perceived social norms were measured, it would be possible to provide a better interpretation of the backgrounds of spectators’ perceived risks. Hence, future research should consider adding more variables. Following our research purposes, this research conducted the data collection from spectators. To add more insights to the context of sport spectatorship, risk perceptions among former spectators who have not attended a sporting event during the pandemic situations should be investigated in follow-up research. Lastly, the game levels of this study contain a limitation. The data collection was conducted at three different levels of the rugby game (i.e., league match, university tournament, and national team match). This approach does not allow drawing conclusions regarding specific game levels. From a practical perspective, it would be interesting to identify differences among several game levels. The authors acknowledge that the advantage of more generalizable findings comes at the expense of more specific results regarding certain game levels. Further research can build upon this study and suggest alternative segmentation possibilities for specific game levels.

Conclusion
This study had two purposes: (1) to classify sport spectators into key segments based on perceived risks associated with a mass-gathered sporting event during the COVID-19 pandemic and (2) to identify each segment’s profiles. Questionnaire surveys of spectators attending a Japanese rugby game were performed ($n = 1,410$). A combination of hierarchical and non-hierarchical clustering methods was performed. The results revealed the five-cluster solution as the optimal number of clusters representing samples. This five-cluster solution contained sufficient stability and validity. This study is the first effort to segment sport spectators based on perceived risks associated with a mass-gathered sporting event in the pandemic situation. Therefore, our findings provide insight into this realm by providing a new viewpoint for understanding sport spectators during a possible future pandemic era.

References


Appendix

<table>
<thead>
<tr>
<th>Authors</th>
<th>Segmentation factor</th>
<th>Profiling factors</th>
<th>Samples</th>
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<tbody>
<tr>
<td>Alexandris and Tsiotsou (2012)</td>
<td>Attachment levels</td>
<td>Team self-expression and involvement</td>
<td>Football spectators</td>
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<td>Bouchet et al. (2011)</td>
<td>Sporting event experience search</td>
<td>Sporting event experience search</td>
<td>Tennis and football spectators</td>
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<td>Chen et al. (2013)</td>
<td>Sport stadium atmosphere</td>
<td>Demographics</td>
<td>Basketball spectators</td>
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<tr>
<td>Floyd and Pennington-Gray (2004)</td>
<td>Perceived risks</td>
<td>Perceived risks, information sources and demographics</td>
<td>Tourists</td>
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<tr>
<td>Hallmann et al. (2022)</td>
<td>Psychological continuum model</td>
<td>Socio-economic information, behavioral variables, etc.</td>
<td>Women’s football spectators</td>
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<td>Kaiser et al. (2019)</td>
<td>Preferences for opposing teams, seat categories and willingness to pay for tickets</td>
<td>Demographics, team identification, etc.</td>
<td>Basketball spectators</td>
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<tr>
<td>Karl (2018)</td>
<td>Perceived risks and uncertainty affinity</td>
<td>Demographics and destination choice variables</td>
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<td>Köchling et al. (2022)</td>
<td>Perceived risks and importance of travel for their own well-being</td>
<td>Demographics and future travel plans</td>
<td>Tourists</td>
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<td>Lyu and Lee (2013)</td>
<td>Leisure benefits</td>
<td>Demographics, attendance characteristics, etc.</td>
<td>Golf spectators</td>
</tr>
<tr>
<td>Matiza and Kruger (2021)</td>
<td>Perceived risks</td>
<td>Demographics, media profile, tourism activities, etc.</td>
<td>Tourists</td>
</tr>
<tr>
<td>Neuburger and Egger (2021)</td>
<td>Perceived risks, perception of COVID-19 and travel behavior</td>
<td>Demographics, perceived risks, perception of COVID-19 and travel behavior</td>
<td>Tourists</td>
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<tr>
<td>Park et al. (2023)</td>
<td>Evangelistic behaviors</td>
<td>Demographics</td>
<td>Football spectators</td>
</tr>
<tr>
<td>Ross (2007)</td>
<td>Brand association</td>
<td>Brand association</td>
<td>Basketball spectators</td>
</tr>
</tbody>
</table>

Source(s): Authors’ own creation

Table A1. Previous segmentation studies in the context of sport spectatorship and segmentation studies based on perceived risks in the context of tourism.

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