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## **Calidad percibida, calidad global del servicio, satisfacción global del servicio, valor percibido del servicio e intenciones futuras de un evento deportivo: Percepciones de los triatletas portugueses**

### **Perceived Quality, Overall Service Quality, Overall Service Satisfaction, Perceived Service Value and Future Intentions of a sport event: Portuguese triathlete perceptions**

### **Qualidade Apercebida, Qualidade Global do Serviço, Satisfação Global do Serviço, Valor Apercebido do Serviço e Intenções Futuras de um evento desportivo: Perceções de triatletas portugueses**

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#### **RESUMEN**

El objetivo de este estudio fue analizar la estructura factorial de un modelo para evaluar la percepción de satisfacción y calidad de un acontecimiento deportivo. Se desarrolló un análisis factorial confirmatorio para probar la estructura factorial. La presente muestra comprendió 208 participantes triatletas portugueses (hombres = 148; Edad media = 41.29 ± 11.28). De estos participantes, 169 declararon practicar ejercicio físico más de 4 veces por semana y 153 dijeron haber participado en 5 o más pruebas de triatlón. Los resultados actuales mostraron que el modelo de medición presentaba un ajuste adecuado (modelo muestral total:  $\chi^2/df = 2.748$ , B-S  $p < .001$ , TLI = .928, CFI = 0.940, SRMR = 0.075, RMSEA = 0.092 (CI = 1.068, 1.671)). Estos resultados apoyan el uso de este modelo para evaluar todas las dimensiones asociadas a un acontecimiento deportivo, en particular el triatlón.

**Palabras clave:** Calidad percibida; Calidad global del servicio; Satisfacción global del servicio; Valor percibido del servicio; Intenciones de futuro.

## ABSTRACT

The aim of this study was to analyse the factor structure of a model to assess the perception of satisfaction and quality of a sport event. Confirmatory factor analysis was developed to test the factor structure. The present sample comprised 208 Portuguese triathlete participants (males = 148; Mean age =  $41.29 \pm 11.28$ ). Of these participants, 169 reported practice of physical activity more than 4 times a week and 153 said they had completed part in 5 or more triathlon events. Current results showed that the measurement model presented adequate fit (total sample model:  $\chi^2/df = 2.748$ , B-S  $p < .001$ , TLI = .928, CFI = 0.940, SRMR = 0.075, RMSEA = 0.092 (CI = 1.068, 1.671)). These results support the use of this model to assess all the dimensions associated with a sporting event, particularly triathlon.

**Keywords:** Perceived Quality; Overall Service Quality; Overall Service Satisfaction; Perceived Service Value; Future Intentions.

## RESUMO

O objetivo deste estudo foi analisar a estrutura fatorial de um modelo de avaliação da percepção da satisfação e da qualidade de um evento desportivo. A análise fatorial confirmatória foi desenvolvida para testar a estrutura fatorial. A presente amostra foi constituída por 208 participantes triatletas portuguesas (sexo masculino = 148; idade média =  $41.29 \pm 11.28$ ). Destes participantes, 169 referiram praticar exercício físico? mais de 4 vezes por semana e 153 afirmaram ter participado em 5 ou mais eventos de triatlo. Os resultados atuais mostraram que o modelo de medida apresentou um ajuste adequado (modelo da amostra total:  $\chi^2/df = 2.748$ , B-S  $p < .001$ , TLI = .928, CFI = 0.940, SRMR = 0.075, RMSEA = 0.092 (IC = 1.068, 1.671)). Estes resultados apoiam a utilização deste modelo para avaliar todas as dimensões associadas a um evento desportivo, em particular o triatlo.

**Palavras chave:** Qualidade Percebida; Qualidade Global do Serviço; Satisfação Global do Serviço; Valor Percebido do Serviço; Intenções Futuras.

## INTRODUCCIÓN

Participants' perception of the satisfaction of sporting events is crucial in sports management. Participant's satisfaction is seen as a key element by organizations of sporting events (Calabuig Moreno et al., 2008). Providing ideal conditions, maintaining, and strengthening relationships between the organization and participants is a transversal issue for all organizations that want to succeed in the events they organize and design, to maintain them over time, boosting monetary gains and social profitability. From the participant's point of view, there is a direct association between satisfaction and the intention to take part in the next edition of the event, making it essential to offer a high-quality service. An organization that offers a quality service establishes a close relationship and creates an emotional bond between the event and the participant, building user loyalty (Alexandris et al., 2006).

The study of participant satisfaction and perceived quality is fundamental for developing strategies and improving the quality of services provided at sporting events. Satisfaction at sporting events refers to the degree of contentment, pleasure or enjoyment that the participant experiences before, during and/or after taking part in sporting events, such as games, competitions, tournaments or other types of activities (Guerra, 2011; Mundina et al., 2005; Mundina & Calabuig, 2011). Similarly, perceived quality refers to the comparison a participant makes between what they expected from a service and what they believe it was actually delivered (Parasuraman et al., 1985). The perceived quality of sports services can be a measure used to make decisions about the overall excellence of the service offered and the fulfilment of the needs, desires and expectations of the users/participants of a sports service (Mundina & Calabuig, 2011).

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The concepts of satisfaction and quality are often confused due to the fact that they are very close, but they are different (Cronin, Jr & Taylor, 1992). In this sense, it is important to make this distinction, correctly marking the frontier between both. Satisfaction is a personal state, while quality is seen as a characteristic of a service.

However, the perception of satisfaction and quality of sporting events is subjective and the outcome (classification) of high or low quality will depend on how the participants perceive the outcome of the service in the context of what is expected (Parasuraman et al., 1985) and to achieve a quality image, the organization must meet or exceed their expectations. This assessment of the satisfaction and quality of a sporting event has been carried out through a cognitive evaluation made by participants of a series of attributes associated with the event and the experience.

In the literature, there are different instruments for assessing the satisfaction of a sporting event. Although they are different, the basis for their creation is identical.

### *SERVQUAL*

The Conceptual model of Service Quality proposed by Parasuraman et al. (1985) suggests that service customers base their quality judgments on the gap between customers' expectations and their perceptions of the service. Parasuraman et al. developed the Service Quality Model (SERVQUAL) instrument, based on the Conceptual Model of Service Quality, based on the paradigm of comparing expectations and perceptions of a service. If expectations are met (or exceeded), service quality is considered positive, which ultimately leads to satisfaction. This instrument assesses five generic dimensions of service quality, made up of 44 items (22 items referring to expectations and another 22 to perceptions): I) tangibility: appearance, equipment, facilities, personnel and appearance; ii) reliability: ability to perform the service offered, completing it reliably and carefully; iii) responsiveness: the willingness, interest and desire to help, attend to and accompany the customer promptly; iv) security: the professionalism of the staff, demonstrated through their knowledge and attention, inspiring credibility in their users and therefore providing security; v) empathy: the personalized attention offered by the organization to its clients.

### *SERVPERF*

Despite its usefulness, the scale has been criticized for its conceptual model, dimensional properties, applicability and validity (Babakus & Boller, 1992; Brady et al., 2002; Buttle, 1996; Calabuig Moreno et al., 2008; Cronin, Jr & Taylor, 1992; Teas, 1993). Cronin e Taylor (Cronin, Jr & Taylor, 1992) claimed that service quality is best understood as a consequence of performance rather than a comparison/difference between expectations and perceptions, and that service quality should be assessed considering participants' perceptions rather than their expectations. This quality indicator based on differences between expectations and perceptions could mislead the respondent. The same authors also point out that SERVPERF is a better version compared to SERVQUAL, as it does not refer to expectations prior to the service (Cronin & Taylor, 1994). Expectations are dynamic and in a constant change, and future instruments should analyze results with more detail. Based on the perception paradigm, SERVPERF has been considered to have greater predictive value for satisfaction and quality, measuring perceptions. In addition, the SERVPERF scale has better psychometric properties and a smaller number of items (Brady et al., 2002; Carrillat et al., 2007; Cronin, Jr & Taylor, 1992).

Several authors argue that the number of dimensions of SERVPERF instrument is not adequate. These authors argue that in certain events the service's quality is much more complex (Babakus & Mangold, 1992; Carman, 1990). To obtain a more complete analysis of the satisfaction and quality of a sporting event, some authors suggest evaluating other parameters that complement the analysis of Perceived Quality, such as Overall Service Quality, Overall Service Satisfaction, Perceived Service Value and Future Intentions, using a multidimensional model (Guerra, 2011; Hightower et al., 2002; Mundina & Calabuig, 2011).

The concept of value for the participant represents the difference between the total value and the total cost, i.e. the difference between the set of benefits the participant expects from the event and the costs they expect to achieve

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when they evaluate, participate in, or reject the event. It is assumed that a participant will be most satisfied when the benefits exceed the costs. Thus, the value of the event is defined by the relationship between the benefits the participant receives compared to the sacrifices they make, based on a relationship between quality and price (Moon et al., 2013), resulting in a latent factor (Sweeney & Soutar, 2001). Finally, as the name suggests, future intentions characterize the behavioral intentions of the participants in the future (Guerra, 2011; Hightower et al., 2002; Mundina & Calabuig, 2011).

### *Triathlon event*

In addition to Formula 1 and golf, other types of sporting events and disciplines have gained prominence in sports management, such as triathlons. Triathlon is a sport that includes swimming, cycling and running, performed consecutively in that order (Strock et al., 2006), created in 1974. It is an Olympic sport and made its first appearance in Sydney 2000. According to the International Triathlon Union, triathlon has several forms of competition, namely Short Distance (Sprint and Olympic) and Long-Distance Triathlon (Half-Ironman and Ironman).

The number of triathletes has grown exponentially over the years. The Triathlon Federation of Portugal, created on 16 October 1989, has 3,800 affiliated athletes and 117 member clubs in 2023, clearly demonstrating the enormous growth of the sport in the country and its importance. In addition to these numbers, there are participants who only practice for leisure, known as amateur athletes. In Portugal, 28 official events have already been scheduled for 2024. For the participants, this practice brings various physiological and psychological benefits (Olmedilla et al., 2018; Parsons-Smith et al., 2022).

These sporting events attract local and non-local participants to the event destination, and assess their perception of the event's dimensions, namely the Perceived Quality, Overall Service Quality, Overall Service Satisfaction, Perceived Service Value and Future Intentions is fundamental to the positive impact and success of the sport event. This evaluation makes it possible to create ideal conditions and maintain solid relations between the organization and the participants, with a view to long-term social success, and allows strategies to be developed to improve the quality of the services provided. (Martin, 2016).

### *Current study*

The various scales of the proposed multidimensional model with the dimensions Perceived Quality, Overall Service Quality, Overall Service Satisfaction, Perceived Service Value and Future Intentions, have already been translated for the Portuguese triathlete population (Guerra, 2011). Guerra et al. (2011) calculated the internal consistency of the dimensions presented in the questionnaire, showing that the items measured the respective construct. However, to check whether the measurement model fits the theoretical model that explains the relationships between the observed variables, it is necessary to carry out a confirmatory factor analysis that analyses whether the theoretical proposal fits the observed data. Validation ensures that the questionnaire measures exactly what it sets out to measure. For example, if a questionnaire is designed to assess customer satisfaction, validation ensures that the questions effectively capture this construct. Validation helps to identify and correct possible biases or systematic errors in the questionnaire that could distort the results. A validated questionnaire is more likely to be accepted and used by other researchers or professionals in the field. Validation lends credibility to the instrument, increasing users' confidence in the data collected and the conclusions drawn. Data collected through a validated instrument results in better decisions, affecting marketing strategies and product management. In short, validating questionnaires is a fundamental step in ensuring that the data collected is accurate, reliable and useful for making informed decisions, contributing to scientific knowledge and complying with ethical and regulatory standards.

Therefore, the main objective of this study is to analyse the factor structure of a model for assessing the perception of satisfaction and quality of sporting events, specifically adapted to the Portuguese triathlete population. Based on the multidimensional model proposed by Guerra (2011), the aim is to check whether the measurement model fits

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the theoretical model that explains the relationships between the observed variables. This validation is crucial to ensure that the instruments used effectively measure the constructs of Perceived Quality, Overall Service Quality, Overall Service Satisfaction, Perceived Service Value and Future Intentions. The following hypotheses were established for this study: i) the multidimensional model proposed by Guerra (2011) is a good fit with the data from the Portuguese triathlete population; ii) the dimensions have distinct constructs and high internal consistency.

### MATERIAL Y MÉTODOS

This study follows a cross-sectional methodology (Ato et al., 2013) and was carried out in accordance with the Declaration of Helsinki, which establishes the fundamental ethical principles for research with human beings and the Ethical Standards in Sport and Exercise Science Research (Harriss et al., 2019).

#### *Participantes*

The sample size calculations were carried out a priori by using the Soper Calculator (Soper, 2022) for structural equation modelling. The aim of these analyses was to identify the ideal sample size needed to appropriately test the hypothesized factor structure of the measurement model. Factors considered included the desired level of statistical power ( $p = 0.9$ ), significance level ( $p = 0.05$ ), latent variables (5), and the number of observed variables (38) were considered. Using the Soper Calculator, we ensured that the sample size was sufficient to obtain reliable and significant results (minimum sample size to detect the effect = 188 participants). This strict method of sample size calculation increases the validity and precision of factor analysis, providing a more precise view of the underlying structure of the variables under study (Soper, 2022; White, 2022).

To take part in this study, participants (volunteers) only needed to sign up for the test and take part in it. After presenting the study and its objectives to the potential participants, they signed the informed consent form, confirming their interest and willingness to take part in the study. A total of 208 Portuguese athletes (147 male and 61 female), range age from 14 to 65 years ( $M = 41.29$ ;  $SD = 11.28$ ), participated in the present study. Of the 208 participants who answered the questionnaire, 81% (169) said that they practiced physical activity more than 4 times a week. 74% (153 participants) said they had already taken part in 5 or more races and only 10% (20 participants) said they had only taken part in one race. Similarly, only 2 per cent (4 participants) said they had never taken part in any other type of sporting event except this one. Participants who did not agree to take part in the study or who did not complete the questionnaire in full were excluded.

#### *Instrumentos*

We used the SERVQUAL scale of perceived service quality most widely used in the literature, adapted by Parasuraman et al. (1988) in the service perceptions version (SERVPERF), adapted to the context, as suggested by several authors (Cronin, Jr & Taylor, 1992; Parasuraman et al., 1988; Yarimoglu, 2014), to assess Perceived Quality. The scale consists of 22 items divided into the following sub-dimensions: Tangibility, Reliability and responsiveness, Safety and Empathy.

Scales adapted from Hightower et al. (2002) were used to assess Overall Service Quality, Overall Service Satisfaction, Perceived Service Value and Future Intentions, each with 5 items, with the exception of Future Intentions, which has 3 items.

After adaptation to the context as suggested by the authors of the scales and translation by Guerra (Guerra, 2011), the final instrument is now made up of 38 items or closed-response questions. Responses are obtained using a five-point Likert scale, ranging from 'Strongly Disagree' (1 point), 'Disagree' (2 points), 'Neither Agree nor Disagree' (3 points), 'Agree' (4 points) and 'Strongly Agree' (5 points), with no question presented having its rating reversed. Answers closer to 1 indicate a negative evaluation, while answers closer to 5 show a positive evaluation. 3 represents a neutral rating.



Each dimension (Perceived Quality, Overall Service Quality, Overall Service Satisfaction, Perceived Service Value, Future Intentions) will be assigned a dependent variable. However, the 'Perceived Quality' dimension is divided into several sub-dimensions (Tangibility, Reliability and responsiveness, Security and Empathy).

Guerra (Guerra, 2011) after translating the scales into Portuguese, calculated the internal consistency of the dimensions and sub-dimensions. The reliability coefficients of the instrument's dimensions and sub-dimensions were acceptable:

1. Perceived Quality (22 items):  $\alpha = 0.941$ ;
- 1.1. Tangibility (3 items):  $\alpha = 0.710$ ;
- 1.2. Reliability and responsiveness (8 items):  $\alpha = 0.840$ ;
- 1.3. Security (5 items):  $\alpha = 0.855$ ;
- 1.4. Empathy (6 items):  $\alpha = 0.868$ .
2. Overall Service Quality (5 items):  $\alpha = 0.905$ ;
3. Overall Service Satisfaction (5 items):  $\alpha = 0.894$ ;
4. Perceived Service Value (3 items):  $\alpha = 0.753$ ;
5. Future Intentions (3 items):  $\alpha = 0.770$ .

#### *Procedimiento*

This is a cross-sectional study involving several Portuguese triathletes (Jacinto et al., 2024). After the event was over, the organization sent a link to the questionnaire to all the participants. When they received the questionnaire, they were instructed to read and accept a consent form. This consent form explicitly described the voluntary nature of their participation, the absence of monetary compensation, the importance of the study and the guarantee of data anonymity. Participants had to confirm their consent by ticking a designated checkbox on the form. If consent was not given, the questionnaire automatically ended. However, after consenting, the participants answered a series of general sociodemographic and non-indicative questions before entering the instrument. The 38-item questionnaire required 7 minutes to complete. This study was approved by the Ethics Committee of the institution to which the first author belongs.

#### *Análisis estadístico*

Initially, descriptive statistics, namely means and standard deviations were calculated, using IBM SPSS STATISTICS version 29 (IBM Corp).

In our study, a Confirmatory Factor Analysis of the model was conducted using the AMOS software (Arbuckle, 2019), employing the Maximum Likelihood estimator. To evaluate the adequacy of our measurement model, we employed established traditional fit indices, including the Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), standard mean square residual (SRMR), and root mean square error of approximation (RMSEA), in conjunction with a 90% confidence interval (CI). We applied threshold criteria endorsed by leading researchers (Byrne, 2016; Hair et al., 2019; Kline, 2016). Specifically, we considered CFI and TLI values equal to or exceeding 0.90 and SRMR and RMSEA values less than 0.08 as indicative of satisfactory model fit.

We assessed the internal consistency using composite reliability coefficients, employing Raykov's formula (Raykov, 1997, 1998), with a predefined cutoff value of 0.70. To evaluate convergent validity, we calculated the average variance extracted (AVE), considering values exceeding 0.50 as acceptable. Discriminant validity was confirmed when the AVE values for individual constructs surpassed the squared correlations between the constructs within the measurement model (Chen, 2008; Enders, 2010; Fornell & Larcker, 1981; Hair et al., 2019).

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### RESULTADOS

The dimension with the highest score given by the participants was General Satisfaction (mean = 4.60; standard deviation = 0.66) and the one with the lowest score was Perceived Quality (mean = 4.09; standard deviation = 0.66). Even so, all the dimensions scored highly.

**Table 1**

*Global event evaluation.*

Dimensions	N	M	SD
Perceived Quality	208	4.09	0.59
Overall Service Quality	208	4.13	0.74
Overall Service Satisfaction	208	4.6	0.66
Perceived Service Value	208	4.1	0.78
Future Intentions	208	4.46	0.63

Notes: N, frequency; M, mean; SD, standard deviation.

Athletes valued the Tangibility (mean = 4.27; standard deviation = 0.66) factor the most, while the least valued was Empathy (mean = 4.27; standard deviation = 0.66) (Table 2). As with the dimensions, all the dimensions scored highly. Tangibility refers to the appearance, facilities, staff, equipment, and communication materials. Empathy, meanwhile, refers to the personalized attention the organization offers its participants.

**Table 2**

*Factors in the perceived quality dimension of the sporting event.*

Factors	N	M	SD
Tangibility	208	4.27	0.66
Reliability and Responsiveness	208	4.06	0.69
Security	208	4.21	0.67
Empathy	208	4	0.77

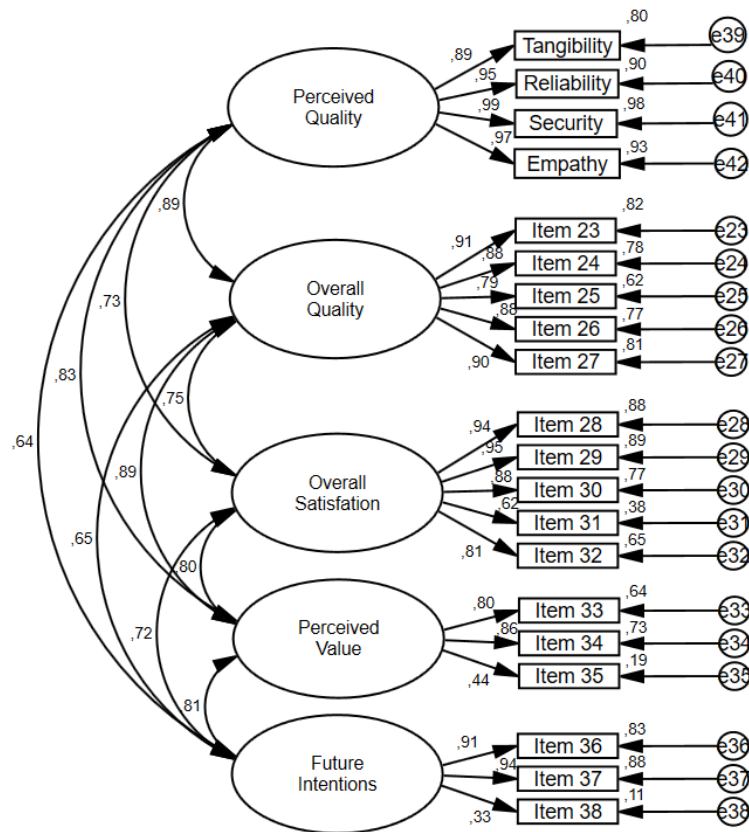
Notes: N, frequency; M, mean; SD, standard deviation.

### *Confirmatory factor analysis*

The model's measurement was assessed for its suitability to the data. Since the first dimension contains sub-dimensions, these were calculated using the weighted average of the items, so that the model was adjusted and could be run. The results of the measurement model demonstrated a good fit to the data: [ $\chi^2/df = 2.748$ , B-S  $p < 0.001$ , TLI = .928, CFI = 0.940, SRMR = 0.075, RMSEA = 0.092 (CI = 1.068, 1.671)]. The results indicate an acceptable fit, as evidenced by incremental indices exceeding the threshold of 0.90 and absolute indices below the threshold of 0.08. These findings support the adequacy and validity of measurement model in capturing the intended constructs and their relationships within the observed data.

Figure 1

Standardized Factor Loading of the model.



All items in the model measurement scales exhibited factor loadings equal to or greater than .50, indicating that they accounted for a minimum of 25% of the variance in their respective latent factors, with the exception of items 35 and 38. Furthermore, the composite reliability (CR) scores for all subscales surpassed the recommended threshold (CR > .70) in both scales, indicating satisfactory internal consistency and suggesting that the items effectively measure the intended constructs. The convergent validity of the scales was also established, with all scores exceeding .50, affirming that the items within each subscale were positively related. In addition, the AVE scores for each construct exceed the acceptable threshold of 0.5, which means that our latent variables capture a substantial proportion of the variance in their respective indicators. These results reinforce the robustness of our measurement model. However, the squared correlations between the latent variables tend to be higher than the AVE scores for the corresponding constructs. This discrepancy raises concerns about the ability of our model to adequately distinguish between these constructs. It is essential to emphasize the substantial correlations between factors observed in table 3. For Perceived Value of Service, the correlations between Perceived Quality, Overall Quality of Service, Overall Satisfaction of Service and Future Intention are remarkably high (.68, .79, .64 and .65 respectively). For Overall Quality of Service, the correlation between Perceived Quality was also high (.79). These high correlations between factors indicate the possibility of overlap or redundancy between our latent constructs, which probably contributes to the problems observed in discriminant validity.



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**Table 3**

*Composite reliability, convergent and discriminant validity.*

Latent variables	CR	AVE	1	2	3	4	5
1. Perceived Quality	.974	0.90	1				
2. Overall Quality of Service	.785	0.76	.79	1			
3. Overall Satisfaction of Service	.838	0.71	.53	.56	1		
4. Perceived Value of Service	.804	0.52	.68	.79	.64	1	
5. Future Intention	.842	0.60	.40	.42	.51	.65	1

Notes: CR = Composite reliability; AVE = Average Variance Extracted; squared correlations are reported below the diagonal line.

### DISCUSIÓN

The aim of this study was to comprehensively examine the model that assesses the Perceived Quality, Overall Service Quality, Overall Service Satisfaction, Perceived Service Value and Future Intentions of participants in a triathlon event and address critical aspects related to its applicability, validity, and effectiveness. More specific, its aimed was to evaluate the factor structure and develop a concise version in the context of Portuguese triathlete participants. Our examination of the model began with a thorough evaluation of its factor structure.

#### *Model Fit and Validation*

Confirmatory factor analysis revealed a good model fit. The total sample met the threshold criteria for the fit indices. Two items have relatively low factor weights, which may be related to the difference in theme from the other questions in the instrument or the fact that the question was changed to a negative one.

The AVE scores for each construct exceed the established threshold of 0.5, indicating that our latent variables effectively cover a considerable part of the variability present in their corresponding indicators. The available research results do not provide specific information on issues or concerns related to the AVE values in the proposed model. The reliability of our measurement model is underlined by the composite reliability values of all constructs, which consistently exceed the widely accepted threshold of 0.7. As far as reliability is concerned, the model demonstrated strong internal consistency, supported by Cronbach's alpha values considered acceptable in previous study (Guerra, 2011).

#### *Theoretical Contributions*

For the Portuguese language, the validated studies, apart from not focusing on the modality, center on spectators (Filho et al., 2019), volunteers (Neto, 2017) or use non-validated instruments (Pinheiro, 2017).

Validating sports questionnaires is an essential process to guarantee the quality and usefulness of the data collected. It benefits not only academic research, but also sports practice and the continuous improvement of the management of sports event organizations (Serrano-Gomez et al., 2010). The first reflections on the validation of sports application instruments in Portugal came from Fonseca and Brito (Fonseca & de Paula Brito, 2005), who concluded that the procedures used by researchers were not uniform and robust. Today, CFA is seen as a powerful statistical approach to evaluating models, improving our understanding of them and promoting theoretical and applied development in sport (Biddle et al., 2001; Cid et al., 2022).

A systematic review study on this topic extracted a total of 21 studies that evaluated the variables of interest in this study (Serrano & Segado Segado, 2015). Of these 21 studies, 4 used the SERVQUAL version by Parasuraman et

al. and 8 use the SERVPERF tool by Cronin & Taylor (Cronin, Jr & Taylor, 1992). Considering all the limitations of these tools, the remaining 9 studies created context-specific tools based on independent criteria, similar to the one carried out by Guerra (2011). Thus, this study validated a tool for Portuguese culture that best fits the context of the sporting event.

Participation in sporting events, particularly triathlons, has become a form of competition and leisure, attracting social, political, and economic interest. In the same sense, organizing a triathlon event is a challenge for federations, organizations and cities that attempt to develop strategies to improve the quality of their services and the satisfaction of participants, to strengthen the event in the long term.

It is known that the satisfaction and quality of the event can predict the image of the destination (local of event), behavioral intentions related to future intentions and even attracting sponsors (Byon et al., 2013; Hightower et al., 2002), The event that achieves the best results in all sectors is particularly differentiating (Tavares, 2007). In addition to predicting future participation, high satisfaction increases the intention to visit the place again and recommend it to friends and/or family (Xiao et al., 2019). Organizing an event is an extremely complex activity because clients/participants are increasingly demanding, requiring ever higher quality services (Martin, 2016).

Participant satisfaction is seen as a key element by organizations that organize sporting events (Calabuig Moreno et al., 2008). Creating the ideal conditions, maintaining, and strengthening relationships between the organization and the participants is transversal to all organizations that want to succeed in the events they plan and organize, to maintain them over time, boosting monetary gains and social profitability.

This study contributes to the existing literature on service quality and satisfaction at sporting events by validating a specific model for the context of triathlon in Portugal. While previous research has focussed on spectators, volunteers or sporting events in general, this study addresses a gap by focusing on triathlete participants. The validation of this instrument in Portuguese culture increases its applicability and relevance, supporting efforts to improve the management of sporting events in various contexts.

#### *Limitations and future recommendations*

A limitation of our study is the lack of control over the moment when participants filled in the questionnaire. Given that participants had the flexibility to fill in the questionnaire at their convenience using the Google Form platform, factors such as the length of the event date and data collection may have influenced their responses. This uncontrolled variability could introduce a certain level of response's bias. In future research, it would be useful to explore methods to standardize the time of questionnaire administration to reduce potential confounding variables for participants. One possible solution is to provide rewards for completing the questionnaires immediately after the test (giveaways, discounts for future events, among others). Another notable limitation of our study stems from the constraints associated with data collection. Another notable limitation of our study stems from the constraints associated with data collection. The sample recruited was one of convenience. The cross-sectional design of the study does not allow us to make inferences that are possible in longitudinal studies. The fact that this study focuses on a Portuguese cultural context may limit the generalizability of the results. To determine cross-cultural validity, studies are needed in different cultural contexts. Although the sample size meets statistical requirements, studies with a larger number of participants are needed. We cannot carry out an exploratory factor analysis, since the data collected (N=208) was worked on from a confirmatory perspective. As such, it is not possible to carry out an exploratory and confirmatory analysis with the same data, since any problems in one analysis or the other could result in errors in one or the other analysis (Kline, 2016). Taking this as a limitation of this study, we also suggest that future studies could carry out a more robust analysis, namely a structural equation modeling, since this is an analysis that combines exploratory and confirmatory analyses.

Although our study provides a first insight into the applicability of the model by studying different people, more research is needed to validate its use in different populations, age groups and sexes of triathlon players, other sports (including individual and team sports), aims or motives (Pérez-López et al., 2015a, 2015b; Serrano Gómez et al., 2012) or other dimensions (Monteiro et al., 2020; Rodrigues et al., 2019). The model may need item adaptations to

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better align with triathletes' unique patterns and context. Future research should explore the impact of the timing of the administration of the questionnaire to provide a picture of the event. The challenges observed in discriminant validity, namely the high correlations between latent constructs, warrant further investigation. Researchers should explore strategies to improve differentiation between the different dimensions and the items within them. Evaluating the perception of athletes at different performance levels should also be considered in future studies (Magaz-González et al., 2023) and the differentiation between local and non-local athletes (An et al., 2020). Finally, future studies with a new sample should examine the relationship between the different dimensions using a structural equation model. Although our study provides a first insight into the applicability of the model by studying different people, more research is needed to validate its use in different populations, age groups and sexes of triathlon players, or other sports (including individual and team sports). The model may need item adaptations to better align with triathletes' unique patterns and context. Future research should explore the impact of the timing of the administration of the questionnaire to provide a picture of the event. The challenges observed in discriminant validity, namely the high correlations between latent constructs, warrant further investigation. Researchers should explore strategies to improve differentiation between the different dimensions and the items within them. Finally, future studies with a new sample should examine the relationship between the different dimensions using a structural equation model.

### CONCLUSIONES

This study validated an instrument to assess the perception of satisfaction and quality in sporting events, specifically in the context of Portuguese triathletes. The results confirm the suitability of the proposed multidimensional model, made up of the dimensions Perceived Quality, Overall Service Quality, Overall Service Satisfaction, Perceived Service Value and Future Intentions. The confirmatory factor analysis showed a good fit of the data to the theoretical model, reinforcing the reliability and validity of the measured constructs.

The validation of this instrument makes a significant contribution to the management of sporting events, providing a robust tool for identifying strengths and areas for improvement in the context of triathlon. Understanding participants' perceptions allows organisations to develop specific strategies to increase service quality and athlete satisfaction, promoting loyalty and the long-term success of events. In addition, the data collected through this model provides valuable information for making informed decisions, with direct implications for marketing strategies, resource management and the planning of future events. This study provides a solid framework for future research, suggesting applying the model to different cultural contexts, sports disciplines and larger samples to generalise and expand the results obtained.

### APLICACIONES PRÁCTICAS

This study contributes to the existing literature on service quality and satisfaction at sporting events by validating a specific model for the context of triathlon in Portugal. While previous research has focussed on spectators, volunteers or sporting events in general, this study addresses a gap by focusing on triathlete participants. The validation of this instrument in Portuguese culture increases its applicability and relevance, supporting efforts to improve the management of sporting events in various contexts.

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## REFERENCIAS

1. Alexandris, K., Kouthouris, C., & Meligdis, A. (2006). Increasing Customers' Loyalty in a Skiing Resort: The Contribution of Place Attachment and Service Quality. *International Journal of Contemporary Hospitality Management*, 18, 414–425. <https://doi.org/10.1108/09596110610673547>
2. An, B., Harada, M., & Sato, S. (2020). Service quality, satisfaction, and behavioral intention in a triathlon event: The different experiences between local and non-local participants. *Journal of Sport & Tourism*, 24(2), 127–142. <https://doi.org/10.1080/14775085.2020.1773296>
3. Arbuckle, J. (2019). *Amos (Version 26.0) [Computer Program]* [Computer software].
4. Ato, M., López-García, J. J., & Benavente, A. (2013). Un sistema de clasificación de los diseños de investigación en psicología. *Anales de Psicología / Annals of Psychology*, 29(3), Article 3. <https://doi.org/10.6018/analesps.29.3.178511>
5. Babakus, E., & Boller, G. W. (1992). An empirical assessment of the SERVQUAL scale. *Journal of Business Research*, 24(3), 253–268. [https://doi.org/10.1016/0148-2963\(92\)90022-4](https://doi.org/10.1016/0148-2963(92)90022-4)
6. Babakus, E., & Mangold, W. G. (1992). Adapting the SERVQUAL scale to hospital services: An empirical investigation. *Health Services Research*, 26(6), 767–786.
7. Biddle, S. J. H., Markland, D., Gilbourne, D., Chatzisarantis, N. L. D., & Sparkes, A. C. (2001). Research methods in sport and exercise psychology: Quantitative and qualitative issues. *Journal of Sports Sciences*, 19(10), 777–809. <https://doi.org/10.1080/026404101317015438>
8. Brady, M. K., Cronin, J. J., & Brand, R. R. (2002). Performance-only measurement of service quality: A replication and extension. *Journal of Business Research*, 55(1), 17–31. [https://doi.org/10.1016/S0148-2963\(00\)00171-5](https://doi.org/10.1016/S0148-2963(00)00171-5)
9. Buttle, F. (1996). SERVQUAL: Review, critique, research agenda. *European Journal of Marketing*, 30(1), 8–32. <https://doi.org/10.1108/03090569610105762>
10. Byon, K. K., Zhang, J. J., & Baker, T. A. (2013). Impact of core and peripheral service quality on consumption behavior of professional team sport spectators as mediated by perceived value. *European Sport Management Quarterly*, 13(2), 232–263. <https://doi.org/10.1080/16184742.2013.767278>
11. Byrne, B. M. (2016). *Structural Equation Modeling With AMOS: Basic Concepts, Applications, and Programming, Third Edition* (3rd ed.). Routledge. <https://doi.org/10.4324/9781315757421>
12. Calabuig Moreno, F., Quintanilla Pardo, I., & Mundina Gómez, J. J. (2008). *La calidad percibida de los servicios deportivos: Diferencias según instalación, género, edad y tipo de usuario en servicios náuticos*. <https://roderic.uv.es/handle/10550/11450>
13. Carman, J. M. (1990). Consumer perceptions of service quality: An assessment of the SERVQUAL dimensions. *Journal of Retailing*, 66(1), 33–55.
14. Carrillat, F. A., Jaramillo, F., & Mulki, J. P. (2007). The validity of the SERVQUAL and SERVPERF scales: A meta-analytic view of 17 years of research across five continents. *International Journal of Service Industry Management*, 18(5), 472–490. <https://doi.org/10.1108/09564230710826250>
15. Chen, F. F. (2008). What happens if we compare chopsticks with forks? The impact of making inappropriate comparisons in cross-cultural research. *Journal of Personality and Social Psychology*, 95, 1005–1018. <https://doi.org/10.1037/a0013193>
16. Cid, L., Monteiro, D., Teixeira, D. S., Evmenenko, A., Andrade, A., Bento, T., Vitorino, A., Couto, N., & Rodrigues, F. (2022). Assessment in Sport and Exercise Psychology: Considerations and Recommendations for Translation and Validation of Questionnaires. *Frontiers in Psychology*, 13. <https://www.frontiersin.org/articles/10.3389/fpsyg.2022.806176>

## Portuguese Triathletes' Perceptions of Sporting Events

17. Cronin, J. J., & Taylor, S. A. (1994). Servperf versus Servqual: Reconciling Performance-Based and Perceptions-Minus-Expectations Measurement of Service Quality. *Journal of Marketing*, 58(1), 125–131. <https://doi.org/10.1177/002224299405800110>
18. Cronin, Jr, J., & Taylor, S. (1992). Measuring Service Quality—A Reexamination And Extension. *The Journal of Marketing*, 56, 55–68. <https://doi.org/10.2307/1252296>
19. Enders, C. K. (2010). *Applied missing data analysis* (pp. xv, 377). Guilford Press.
20. Filho, M. A. B., Pedroso, C. A. M. de Q., Miranda, Y. de H. B. de, Sarmiento, J. P., Rodrigues, V. H., Corte-Real, N., Fonseca, A. M., & Dias, C. (2019). Qualidade De Serviços E Satisfação De Espectadores De Eventos Esportivos: Uma Revisão Sistemática. *Movimento - Revista de Educação Física da UFRGS*, 24(4), 1381–1394.
21. Fonseca, A. M., & de Paula Brito, A. (2005). A questão da adaptação transcultural de instrumentos para avaliação psicológica em contextos desportivos nacionais—O caso do Task and Ego Orientation in Sport Questionnaire (TEOSQ). [The issue of the cross-cultural adjustment of instruments for psychological evaluation in national sport contexts—The case of the Task and Ego Orientation in Sport Questionnaire (TEOSQ)]. *Psychologica*, 39, 95–118.
22. Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18(1), 39–50. <https://doi.org/10.2307/3151312>
23. Guerra, J. M. P. (2011). *Avaliação da qualidade dos eventos desportivos: As perspectivas dos diferentes actores sobre os eventos no Município de Loulé* [MasterThesis, Universidade de Évora]. <http://dspace.uevora.pt/rdpc/handle/10174/15097>
24. Hair, J., Babin, B., Anderson, R., & Black, W. (2019). *Multivariate Data Analysis* (8th ed). Pearson Educational.
25. Harriss, D. J., MacSween, A., & Atkinson, G. (2019). Ethical Standards in Sport and Exercise Science Research: 2020 Update. *International Journal of Sports Medicine*, 40(13), 813–817. <https://doi.org/10.1055/a-1015-3123>
26. Hightower, R., Brady, M. K., & Baker, T. L. (2002). Investigating the role of the physical environment in hedonic service consumption: An exploratory study of sporting events. *Journal of Business Research*, 55(9), 697–707. [https://doi.org/10.1016/S0148-2963\(00\)00211-3](https://doi.org/10.1016/S0148-2963(00)00211-3)
27. Jacinto, M., Sousa, M., Margarido, C., Varela, J., Dias, S., Santos, R., Monteiro, D., Matos, R., Antunes, R., & Marques, J. (2024). A satisfação e qualidade do evento Triatlo de São Martinho do Porto 2023. *Cuadernos de Psicología del Deporte*, 24(2), Article 2. <https://doi.org/10.6018/cpd.596661>
28. Kline, R. B. (2016). *Principles and Practice of Structural Equation Modeling* (Fourth edition). The Guilford Press.
29. Magaz-González, A.-M., Sahelices-Pinto, C., Mendaña-Cuervo, C., & García-Tascón, M. (2023). Experienced vs. Novice Participants Perception of Overall Quality and Intention to Join in Future Sport Trials: Case European Duathlon Championship. *European Journal of Investigation in Health, Psychology and Education*, 13(8), Article 8. <https://doi.org/10.3390/ejihpe13080102>
30. Martin, M. J. (2016). *Customers' determination of service quality and satisfaction in a return/repair process: A quantitative study*. 20, 36–52.
31. Monteiro, D., Cid, L., Teixeira, D. S., Fonseca, T., Duarte-Mendes, P., Silva, L. M., & Rodrigues, F. (2020). Understanding Needs Satisfaction and Frustration in Young Athletes: Factor Structure and Invariance Analysis. *International Journal of Environmental Research and Public Health*, 17(11), Article 11. <https://doi.org/10.3390/ijerph17114046>
32. Moon, K.-S., Ko, Y. J., Connaughton, D. P., & Lee, J.-H. (2013). A mediating role of destination image in the relationship between event quality, perceived value, and behavioral intention. *Journal of Sport & Tourism*, 18(1), 49–66. <https://doi.org/10.1080/14775085.2013.799960>
33. Mundina, J., & Calabuig, F. (2011). La calidad de servicio percibida de un gran evento deportivo como indicador de gestión. *Journal of Sports Economics & Management*, 1, 31–47.
34. Mundina, J., Quintanilla, I., Sanpedro, J., Calabuig, F., & Hervàs, J. (2005). *Estudio de la calidad percibida y la satisfacción de los espectadores y los deportistas de los juegos del Mediterráneo*.



35. Neto, A. M. de A. (2017). *Motivação e satisfação dos voluntários num evento desportivo, estudo de caso da equipa de animação do Sporting Clube de Portugal* [MasterThesis]. <https://www.repository.utl.pt/handle/10400.5/14130>
36. Olmedilla, A., Torres-Luque, G., García-Mas, A., Rubio, V. J., Ducoing, E., & Ortega, E. (2018). Psychological Profiling of Triathlon and Road Cycling Athletes. *Frontiers in Psychology*, *9*. <https://doi.org/10.3389/fpsyg.2018.00825>
37. Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1985). A Conceptual Model of Service Quality and Its Implications for Future Research. *Journal of Marketing*, *49*(4), 41–50. <https://doi.org/10.2307/1251430>
38. Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, *64*(1), 12–40.
39. Parsons-Smith, R. L., Barkase, S., Lovell, G. P., Vleck, V., & Terry, P. C. (2022). Mood profiles of amateur triathletes: Implications for mental health and performance. *Frontiers in Psychology*, *13*. <https://doi.org/10.3389/fpsyg.2022.925992>
40. Pérez-López, R., Morales-Sánchez, V., Anguera, M. T., & Hernández-Mendo, A. (2015a). Evaluación de la calidad total en servicios municipales deportivos orientados a la población infantil: Aportaciones desde el análisis cualitativo con ATLAS.ti. *Cuadernos de Psicología Del Deporte*, *15*(1), 143–150. <https://doi.org/10.4321/S1578-84232015000100014>
41. Pérez-López, R., Morales-Sánchez, V., Anguera, M. T., & Hernández-Mendo, A. (2015b). Hacia la calidad de servicio emocional en organizaciones deportivas orientadas a la población infantil: Un análisis cualitativo. *Revista Iberoamericana de Psicología del Ejercicio y el Deporte. Las Palmas de Gran Canaria: Universidad de Las Palmas de Gran Canaria, Servicio de Publicaciones, 2015 . Vol. 10, n. 2. ISSN 1886-8576*. <https://accedacris.ulpgc.es/jspui/handle/10553/13615>
42. Pinheiro, S. C. da S. R. (2017). *Estudo de impacto e satisfação de evento desportivo: Um caso prático* [MasterThesis]. <https://repositorio.uac.pt/handle/10400.3/4105>
43. Raykov, T. (1997). Estimation of composite reliability for congeneric measures. *Applied Psychological Measurement*, *21*, 173–184. <https://doi.org/10.1177/01466216970212006>
44. Raykov, T. (1998). Coefficient Alpha and Composite Reliability With Interrelated Nonhomogeneous Items. *Applied Psychological Measurement*, *22*(4), 375–385. <https://doi.org/10.1177/014662169802200407>
45. Rodrigues, F. F., Neiva, H. P., Marinho, D. A., Mendes, P., Teixeira, D. S., Cid, L., & Monteiro, D. (2019). Assessing Need Satisfaction and Frustration in Portuguese Exercise Instructors: Scale validity, reliability and invariance between gender. *Cuadernos de Psicología Del Deporte*, *19*(1), Article 1. <https://doi.org/10.6018/cpd.347331>
46. Serrano Gómez, V., García García, O., Hernández Mendo, A., & Morales Sánchez, V. (2012). La gestión del servicio de entrenamiento personal ¿Cuáles son los motivos y objetivos de las mujeres que lo contratan? *RICYDE. Revista Internacional de Ciencias del Deporte*, *8*(29), 245–257.
47. Serrano, J. A., & Segado Segado, F. (2015). Analysing instruments for measuring perceived sport service quality: A literature review. *Cultura\_Ciencia\_Deporte [CCD]*, *10*(28). <https://doi.org/10.12800/ccd.v10i28.516>
48. Serrano-Gomez, V., Boubeta, A., García-García, O., & Hernández Mendo, A. (2010). La evaluación de la calidad percibida del servicio como elemento clave para la gestión de los clubs de golf en España. *Apunt. Educación Física y Deportes*.
49. Soper, D. (2022). *Factorial Calculator [Software]* [Computer software].
50. Strock, G. A., Cottrell, E. R., & Lohman, J. M. (2006). Triathlon. *Physical Medicine and Rehabilitation Clinics of North America*, *17*(3), 553–564. <https://doi.org/10.1016/j.pmr.2006.05.010>
51. Sweeney, J. C., & Soutar, G. N. (2001). Consumer perceived value: The development of a multiple item scale. *Journal of Retailing*, *77*(2), 203–220. [https://doi.org/10.1016/S0022-4359\(01\)00041-0](https://doi.org/10.1016/S0022-4359(01)00041-0)
52. Tavares, A. (2007). *Gestão da qualidade e da excelência nos eventos desportivos: O modelo MEDE como ferramenta de gestão de eventos desportivos*. <https://repositorio-aberto.up.pt/handle/10216/13857>
53. Teas, R. K. (1993). Consumer Expectations and the Measurement of Perceived Service Quality. *Journal of Professional Services Marketing*, *8*(2), 33–54. [https://doi.org/10.1300/J090v08n02\\_05](https://doi.org/10.1300/J090v08n02_05)

## Portuguese Triathletes' Perceptions of Sporting Events

54. White, M. (2022). Sample size in quantitative instrument validation studies: A systematic review of articles published in Scopus, 2021. *Heliyon*, 8(12), e12223. <https://doi.org/10.1016/j.heliyon.2022.e12223>
55. Xiao, Y., Ren, X., Zhang, P., & Ketlhoafetse, A. (2019). The effect of service quality on foreign participants' satisfaction and behavioral intention with the 2016 Shanghai International Marathon. *International Journal of Sports Marketing and Sponsorship*, 21(1), 91–105. <https://doi.org/10.1108/IJSMS-04-2019-0037>
56. Yarimoglu, E. (2014). A Review on Dimensions of Service Quality Models. *Journal of Marketing Management*, 2, 79–93.