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Ribeiro, T, Correia, A, Biscaia, R & Figueiredo, C

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**Examining service quality and social impact perceptions of the 2016 Rio de Janeiro
Olympic Games**

Tiago Ribeiro, Centro Universitário Augusto Motta, Rio de Janeiro, Brazil

Abel Correia, University of Lisbon, Portugal

Rui Biscaia, Coventry University, UK

Carlos Figueiredo, Centro Universitário Augusto Motta, Rio de Janeiro, Brazil

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Please address correspondence to:

Rui Biscaia

Jaguar Building, School of Marketing and Management, Coventry University

Priory Street, CV1 5FB, Coventry, United Kingdom

Email: rui.biscaia@coventry.ac.uk

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Examining service quality and

Olympic Games through a self-administered questionnaire ($n =$ **social impact perceptions of the 2016 Rio de Janeiro Olympic Games**)

Abstract

Purpose: The current article examines the effects of service quality on perceived positive and negative social impact of the 2016 Rio de Janeiro Olympic Games.

Research method: A field study was conducted in Rio de Janeiro, and data were collected from residents who attended the 519). The questionnaire included measures of perceived service quality, positive and negative social impact. A confirmatory factor analysis (CFA) analysed the psychometric properties of the constructs, and a subsequent structural equation model (SEM) examined the relationships between service quality and social impact perceptions.

Results and Findings: The results show good psychometric properties of a multidimensional construct of service quality composed of the technical, functional, aesthetic, access, accommodation and complementary events dimensions. The service quality construct was significantly related to both positive social impact (city image and community pride enhancement, social experiences and public infrastructures) and negative social impact (social conflicts and costs) perceptions.

Implications: This study contributes to the literature by examining the role of service quality in sport mega-events and testing on different facets of social impact. The findings highlight that social atmosphere and new experiences in the Olympic Games are critical when planning these events.

Keywords: Service Quality; Social Impact; Mega Sport Events; Olympic Games; Host cities.

Introduction

Sport mega-events are generally regarded as both economic and social developmental catalysts because they attract numerous spectators, revitalize deteriorated areas, while also having the potential to enhance the image of the host city and reinforce the cohesion of local community (e.g., Fredline and Faulkner, 2000; Inoue and Havard, 2014; Mao and Huang, 2016). Previous studies have devoted great attention to the economic impact of sport mega-events due its role to evaluate event's performance (e.g., Porter and Fletcher, 2008). Nevertheless, attention must also be paid to the social impact as these events have been recognized to be "a core source of potential event value" (Chalip, 2006, p. 109) and may assume critical importance in the medium and long run for hosts (Inoue and Havard, 2014). Due to the nature of sport mega-events, understanding its social impact is paramount to aid policy makers and provide unique experiences for residents and other consumers (Devine and Devine, 2004; Kim and Walker, 2012). Sport mega-events have the potential to generate positive perceptions of social outcomes among residents of the host city such as increased community pride and opportunities for cultural experiences (Mao and Huang, 2016; Inoue & Havard, 2014), but also negative impacts including increased public spending, conflicts, and enhanced cost of living (Mao and Huang, 2016; Pillay and Bass, 2008). Thus, understanding what factors drive residents' perceptions of the social impact of sport mega-events assume a critical importance.

Good standards of service quality in sport events have been considered of critical importance for both hosts and consumers because of its role on social outcomes (Kim et al., 2014). For example, Biscaia et al. (2017) noted that a positive relationship between service quality and subsequent value perceptions of a sport mega-event, while Kim and

Walker (2012) measured the sense of pride in the host city (i.e. social outcome) through service quality perceptions (e.g., public services, police and fire services). These studies suggest that good service delivery at sport mega-events have the potential to increase social impact perceptions, and this view is supported by anecdotal evidence showing that Brazilians' assessment of the quality of the 2016 Rio Olympic Games contributed to increase their civic pride (The Guardian, 2016). In addition, sport mega-events such as the Olympic Games commonly represent unique life opportunities for consumers and hosts. To this end, understanding how service delivery at sport mega-event such as the Olympic Games relates with social impact is important because there are many core and auxiliary service endeavours with potential to offer compelling opportunities to a host country beyond the event itself (Kim and Morrison, 2005).

Most studies about service quality in sport events have focused on the activities inside the arena (Ko et al, 2011; Koo et al, 2009), but sport mega-events extend to the host city and unfold during a long-time period before, during and after the actual competitions inside the arenas (Biscaia et al., 2017). Thus, it is important to consider a more holistic perspective of service quality delivery in sport mega-events in order to better understand how to generate positive and/or negative social outcomes. Thus, the purpose of the current study is to examine the effects of service quality on perceived positive and negative social impact in the host cities. It is expected that this study will contribute to aid organizing committees and public policy makers involved in the implementation of sport mega-events.

Theoretical background

Sport mega-events

Sport mega-events are large-scale cultural events with a dramatic character, mass popular appeal and international significance (Roche, 2000). As noted Taks (2013), 'Mega' refers to the largest and most significant events and tend to generate high levels of tourism, media coverage, prestige and impact for the host community. A sport mega-event is different than a regular sport event in the sense that the former is larger in size, scope and appeal for media and consumers (Cornelissen, 2004). Also, sport mega-events generally require major infrastructure projects and complementary service delivery in the host city, while that is usually not the case for regular sport events. Furthermore, they have a shorter duration and are out of the ordinary (Taks, 2013), having a transient nature (i.e., not held every year; Nadeau et al., 2016). To this end, sport mega-events such as the Olympic Games often have a more holistic nature and stronger impact on the host city (Wilson, 2006), as opposed to regular sport events such as league competitions.

For example, the Olympic Games often promote urban development as part of regeneration strategies of the host city (Taks, 2013), as well as cultural opportunities and this is not the case for regular sport events. Hosting a sport mega-event such as the Olympic Games has become an important strategy used by some countries in an attempt to promote social leverage (Alegi, 2001; Chalip, 2006). The Olympic Games are one-time events that usually have long-term effects (both positive and negative) on host communities (Mao and Huang, 2016). When the Olympic Games were hosted in Barcelona (2012), residents were able to take advantage of the new sport infrastructures and improved neighbourhoods that were left after the event (Horne and Manzenreiter, 2006). On the contrary, before the Seoul Olympic Games (1988), it was estimated that 700,000 people were evicted, and the same happened to around 300,000 ahead of the 2008 Beijing Olympic Games (Horne and Manzenreiter, 2006).

A sport mega-event is not only about promoting the host cities for visitors, but also giving visibility to the local communities (Whitson, 2004). A number of developing countries have hosted sport mega-events; yet, there is a lack of analysis of its social impacts in developing countries (Parent and Chappelet, 2015). For example, in recent years, Brazil hosted numerous sport mega-events (e.g., Olympic Games, FIFA World Cup, Pan-American Games) as part of a strategy to demonstrate the country's vitality (Santos, 2014). However, examinations of service quality delivered during these events and subsequent social impact are lacking. Consistently, it is important to analyse the experiences delivered during the events and produce new tools of interest to Brazil (Conchas, 2014) to better understand social outcomes.

Service quality in sport mega-events

A good service quality in sport events is often suggested to generate benefits for consumers (Biscaia, 2015; Theodorakis and Alexandris, 2008) and hosts (Biscaia et al., 2017; Gibson et al., 2008). Service quality refers to the consumer's impression about the excellence of the service provided by the host (Liu et al., 2009), and these impressions can change according to the social and cultural context (Papadimitriou and Karteliotis, 2000). A high standard of service quality at the events is a critical issue for hosts (e.g., Ko et al., 2011) due to its impact on the event's value creation (Biscaia et al., 2017).

Previous studies have mainly focused on regular sport events such as single sport league matches, with the technical, functional and aesthetic elements being highlighted as part of the service quality construct (e.g., Greenwell et al., 2002; Biscaia et al., 2013; Yoshida and James, 2011). However, little effort has been done to understand the conceptualization of the construct in relation to transitory sport mega-

events (Nadeau et al., 2016). Sport mega-events often represent a once in a lifetime experience and consumers' interaction with the service includes many encounter types (Meyer and Schwager, 2007) both within and outside the sport facilities (e.g., team training sites, fan zones, music festivals or cultural events; Biscaia et al., 2017). A more holistic approach is required and there is a call in the literature to consider both sport and social encounters when examining usage encounter in the sport context (Yoshida, in press). As noted by Shonk and Chelladurai (2008), in addition to the contest itself, consumers' perceptions of sport mega-events are influenced by external aspects such as accessibility, accommodations, and venues. Theodorakis and Alexandris (2008) further refer that all aspects related to the experience in the city will likely contribute to consumers' overall evaluation of the event. In this sense, one can argue that conceptualizations of service quality in sports mega-events should capture both the action within the sports facilities and the features or activities in the host city.

Based on previous research and remaining gaps, the current study argues that the conceptualization of service quality in the Olympic Games should capture service delivered inside the Olympic facilities as well as in the host city. Inside of the Olympic facilities, the dimensions of technical, functional and aesthetic quality were considered (Yoshida and James, 2011). Following Yoshida and James (2011), technical quality refers to the consumers' perceptions of the core product (i.e., teams, star players, competitiveness of the game, referees and uncertainty of game outcome). Functional quality relates to the interactions with frontline employees and facility function including aspects such as frontline employees, access within the facilities, seat space and security (Biscaia, 2015; Yoshida and James, 2011). In turn, aesthetic quality refers to the aesthetically pleasing features of the service environment and ancillary products within the sport facility (i.e., facility aesthetics and entertainment, crowd experience and

sociability; Theodorakis et al., 2015; Yoshida and James, 2011). In the host city (i.e. outside of the Olympic sport facilities), three additional dimensions of service quality were considered: complementary events, access and accommodation quality. Access quality is defined as the ‘easy and speed’ with which consumers can reach the desired locations (Shonk and Chelladurai, 2009) and may include aspects such as parking areas, airports, freeways, and/or public transportation (Getz, 1997). Accommodation quality refers to service quality within hotels, motels, cabins, lodges and resorts (Shonk and Chelladurai, 2009) that are officially recognized by the organizing committee of the Olympic Games and may include aspects such as staff, reception, bar and restaurant, room quality and/or safety (Marôco and Marôco, 2013). Finally, complementary events quality is defined in the current study as the social and cultural events being delivered in the host city. These complementary events often allow to experience the city atmosphere and local culture (Brown et al., 2013) and should be considered when measuring service quality in sport mega-events because consumers spend a great amount of time outside the sport facilities in different service encounter types (Brown et al., 2013; Yoshida, in press).

Social impact of sport mega-events

While earlier studies have mainly examined sport mega-events in terms of their economic impact (e.g., Crompton, 1999), a growing body of researchers are now focusing on the examination of the social impact, which is associated with more intangible benefits (Inoue and Havard, 2014; Balduck et al., 2011; Kim and Petrick, 2005). The social impact of sport mega-events assume a vital importance, especially for hosts of transitory sport mega-events such as the Olympic Games (Pranic et al., 2012). This is even more important for cities or countries where these events are subject to

criticism by the population (Dulac and Henry, 2001), such as the case of the 2016 Rio de Janeiro Olympic Games. To this respect, Conchas (2014) raised the question of a potential lack of concern with the welfare of the citizens. Also, anecdotal evidence have suggested controversies related to increased public spending, incomplete infrastructures and public health problems (International Business Times, 2016) that resulted in opposition, delays, and legal actions by the population (Gürsoy and Kendall, 2006).

Following Balduck et al. (2011), social impact in the current study refers to sustainable changes in the collective and individual value systems, lifestyle and quality of life of local residents (Taks, 2013). The social exchange theory (SET; Ap, 1992) and social representation theory (SRT; Pearce et al., 1996) help explaining social impact perceptions of sport mega-events. Generally, SET postulates that reward-seeking is a key ingredient in the decision to enter into an exchange (Cropanzano and Mitchell, 2005). In the context of sport mega-events, the relationships between event hosts and local residents are evaluated positively or negatively based on the perceived benefits and costs associated with hosting these events (Waite, 2003). The SRT has been used as an alternative framework of preconception systems, images and values about certain phenomena (Kim et al., 2006). When applied to sport mega-events, information sources such as new experiences, knowledge and values (Fredline and Faulkner, 2000), tend to shape local residents primary perceptions and influence their representations (Fredline, 2005). It means that positive shared experiences by hosts and visitors may be vital for both short- and long-term success of the event (Gürsoy and Rutherford, 2004).

Following Mao and Huang (2016) and Balduck et al (2011), the current study argues that social impact of sport mega-events should be measured through both positive (city image and community pride enhancement, social experiences and public infrastructures) and negative (social conflicts and costs) dimensions. As for the positive

social impact, the dimension of city image and community pride enhancement refers to an individual's impression of the city's increased reputation and awareness owed to the event (Mao and Huang, 2016; Crompton, 2004). Social experiences are related to aspects that may increase residents and/or consumers' interactions, and may include community social development, leisure opportunities and new experiences (Mao and Huang, 2016; Ma et al., 2013). The dimension of public infrastructures refers to pride resulting from improved infrastructures in the host city such as urban regeneration, public and sport facilities (Liu, 2016; Gratton and Preuss, 2008). Regarding negative social impact, the dimension of social conflicts refers to increased difficulties for living in the host city including social pressure, disorder, and congestion (Mao and Huang, 2016; Balduck et al., 2011). In turn, the costs dimension refers to increased public spending and price inflation in the host city (Deccio and Baloglu, 2002; Pillay and Bass, 2008).

Previous studies have suggested that sport mega-events have the potential to generate social impacts (Chalip, 2006; Mao and Huang, 2016), but little is known about what factors drive perceptions of social impact. In this study, we argue that quality of service delivery in the 2016 Rio de Janeiro Olympic Games may influence how consumers perceive the social impact. Even though previous studies have not empirically tested a direct relationship between these two constructs (i.e. service quality and social impact perceptions), favourable service quality has been suggested to impact sport mega-event event value assessments (Biscaia et al., 2017). That is, the outcome of a service experience should be evaluated based on an experiential perspective (Yoshida et al., 2013) suggesting that either positive or negative social outcomes may be associated with the service delivery of sport mega-events. This may be particularly important for transitory sport mega-events such the Olympic Games due to its strong

social impact on host countries (Cornelissen, 2010). Social impacts often become apparent in the form of immediate and noticeable changes in the life quality of the host communities (Teo, 1994; Brunt and Courtney, 1999). For example, Watt (2013) reported that the Olympic Park in 2012 London Olympic Games allowed to accelerate gentrification and displacement of residents. Also, the International Olympic Committee is investing in sustainability measures that encompass social spheres in all stages of the Olympic Games implementation (IOC, 2014). Winning the bid to host a sport mega-event such as the Olympic Games is an achievement by the host cities (Biscaia et al., 2017), and the subsequent delivery of high standards of service quality often generates positive social outcomes as citizens tend to feel pride of the city and country's success (Waite, 2003) both inside and outside the sport facilities where the competitions take place. Also, the Olympic Games allow for an improvement of city infrastructures (Sant and Mason, 2015) to be experienced during and after the event, while higher prices, conflicts or congestions may also be part of the experience during and after the unfolding of the event. To this end, one may argue that service quality during a sport mega-event may influence both positive and negative social impact perceptions due to the opportunities generated for hosts beyond the event itself (Kim and Morrison, 2005).

For these reasons, and considering the controversies associated with Brazil hosting the 2016 Rio Olympic Games (International Business Times, 2016), this study aims to understand the extent to which the event's social impact perceptions are influenced by service quality. Drawing upon previous literature (e.g., Biscaia et al., 2017; Mao and Huang, 2016; Pillay and Bass, 2008) and remaining limitations (i.e., limited knowledge of perceived social impact drivers), the following hypotheses are proposed:

H1: The better the perceived service quality, the stronger the positive social impact perceptions.

H2: The better the perceived service quality, the lower the negative social impact perceptions.

Method

Research settings

Brazil is a very populated country and with significant ambitions in international sports (Daily Telegraph, 2015). Rio de Janeiro was the first city in South America to receive the Olympic Games (National Post, 2016). In the 2016 edition of the Olympic Games held in Rio de Janeiro, a total of 11.238 athletes representing 207 countries have participated. At the same time, the event was an opportunity to show the broader aspirations of the city for becoming an even greater global city (IOC, 2017). However, the process leading Rio de Janeiro to host the Olympic Games was fraught with difficulties. The costs surpassed the initial estimations in \$1.6 billion (International Business Times, 2016), tens of thousands of residents were displaced (e.g., Autodromo Village community), a golf course was built atop a former ‘nature protected site’, and Rio’s state government turned its pockets inside out looking for money to pay salaries and to keep hospitals open (International Business Times, 2016). All these organizational issues may have had the potential to influence perceptions of the social impact of the event.

Participants and data collection

The study was conducted with a sample of Rio de Janeiro residents who attended at least one live competition during the Olympic Games. All participants voluntarily accepted to participate and signed an informed consent form. Data were collected during ten consecutive days in the surroundings of three Olympic sport facilities (i.e.,

Maracanã, *Maracanãzinho* and Olympic Stadium) and after participants have attended a contest in one of these venues. A team of five surveyors from a local University and an experienced supervisor collected the data. Each surveyor was assigned by the supervisor to a specific area surrounding the stadium. The surveyors approached potential respondents after the competitions, explained the project, and asked for their participation. The following criteria were used for selecting participants: (i) individuals who attended the competition inside the Olympic sports facilities in order to ensure an appropriate representation of event consumers; (ii) individuals who were fluent in the Portuguese language, because of the language of the survey and the objectives of the study; (iii) individuals who lived in Rio de Janeiro State but stayed in accommodations recognised by the Olympic Games (e.g., hotel, hostel, etc.). To this respect, it is important to note that the State of Rio de Janeiro occupies an area of 43,780,172 km² and have around 16 million people (*Instituto Brasileiro de Geografia e Estatística*, 2016) meaning that many State residents had to stay away from their houses to attend the event. A total of 592 surveys were collected. After data screening, 519 completed responses were deemed usable for analysis. About two-thirds of the participants were male (70.7%). The ages ranged from 18 to 65 years old, predominantly in the 20-29 age bracket (36.2%). Most of the respondents were favourable to host the event in Rio de Janeiro (80.4%), with 9.8% being unfavourable and 9.8% not providing their opinion.

Measures

The survey was based on previous literature and included three sections. The first one was designed to measure perceptions of service quality. Section two captured the perceptions of social impact. Finally, section three measured sociodemographic characteristics of the respondents.

Service quality. Service quality was measured through the dimensions of technical, functional, aesthetic, access, accommodation and complementary events (see Table 1). *Technical quality* was measured using three items. Two of these items were derived from Biscaia et al. (2013) to gauge the performance of teams and referees, while one item regarding the competitiveness was adopted from Koo et al. (2009). Similarly, *Functional Quality* was measured using three items. Two items based on Biscaia et al. (2013) were used to capture perceptions of frontline employees and security. In turn, one item about the volunteers were derived from Kim et al. (2014) due to the important role of these people in the Olympic Games. The construct of *Aesthetic Quality* was based on Biscaia et al. (2013) and Theodorakis et al. (2015), and included three items about game atmosphere, crowd experience and entertainment. *Access Quality* was measured through a 3-item scale proposed by Shonk and Chelladurai (2008, 2009) capturing accessibilities within the city to sport venues. The *Accommodation Quality* construct consisted of three items related to staff service, room quality and safety of the accommodations that were officially recognized by the organizing committee of the Olympic Games. These items were adapted from Marôco and Marôco (2013) to the context of this sport mega-event. Finally, *Complementary Events Quality* were adapted from Biscaia et al. (2017) and Pfitzner and Koenigstorfer (2016), and included three items to measure perceptions of city atmosphere, local events available for consumers.

Social impact. Social impact was measured through the dimensions of city image and community pride enhancement, social experiences and public infrastructures (positive impact) and social conflicts and cost (negative impact) (see Table 1). Perceptions of *City Image and Community Pride Enhancement* were measured using a 3-item scale based on Mao and Huang (2016) and capturing image, community pride and international recognition of Rio de Janeiro. The construct of *Social Experiences* was

measured using four items related to social cohesion and new leisure opportunities that were adapted from Mao and Huang (2016) and Ma et al (2013). *Public Infrastructures* were assessed using the 3-item scale proposed by Liu (2016) with the items capturing perceptions of public transportation, sport facilities and general infrastructure. On the other hand, the *Social conflicts* construct included four items that were adapted from Mao and Huang (2016) and Balduck et al (2011) and were focused on perceptions of community social pressure, disorder and congestion derived from the event. Finally, perception of *Costs* included two items proposed Deccio and Baloglu (2002) and Pillay and Bass (2008) capturing the fair use of government financial resources and increases in price levels derived from the event.

All items were translated into Portuguese and back-translated into English to ensure accuracy between the original scales and the translated versions (Banville et al., 2000). This process included four scholars who are fluent in both languages and with experience in sport mega-event related research. Next, a native Brazilian researcher conducted a content analysis of the items in terms of their clarity for the Brazilian population. At this stage, suggestions for changing the wording in six items were provided. All changes were accepted, and then the items were randomly placed in a questionnaire for a pre-test with native Brazilians. A sample of 90 students were randomly selected from a Brazilian university in Rio de Janeiro. At this stage, ten other items were refined for the final data collection. All items in the final survey were measured using a 5-point Likert-type scale (1=“Strongly Disagree”, to 5=“Strongly Agree”).

Data analysis

Data were analysed using AMOS 22.0. First, a confirmatory factor analysis (CFA) was conducted to assess the measurement model. Composite reliability (CR) was tested to measure the internal consistency of the constructs (Hair et al., 2009). The average variance extracted (AVE) was estimated to evaluate convergent validity, while discriminant validity was established when AVE for each construct exceeded the squared correlations between that construct and any other (Fornell and Larcker, 1981). Second, a structural equation model (SEM) was estimated to test the research hypotheses. The appropriateness of both the measurement and structural models was assessed with the ratio of chi-square (χ^2) to its degrees of freedom, Tucker-Lewis Index (TLI), comparative-of-fit index (CFI), goodness-of-fit index (GFI), and root mean square error of approximation (RMSEA). The significance of the structural weights was evaluated using the Z tests produced by AMOS and statistical significance was assumed at a 0.05 level.

Results

Measurement model

In this study, service quality is a second-order construct composed by technical, functional, aesthetic, access, accommodation and complementary events quality (first-order constructs), while social impact includes two second-order constructs composed by positive impact (three first-order constructs: city image and community pride enhancement, social experiences and public infrastructures) and negative impact (two first-order constructs: social conflicts and costs). First, we analysed the first-order constructs to verify the psychometric properties and subsequently the second-order measurement model was tested. The fit indices, standardized loadings, modification indices, and item-level theoretical rationale (Anderson and Gerbing, 1988; Kline, 2005;

Marôco, 2010) were all considered. The results of the CFA showed that the factor loading of three items related to service quality and two items related to social impact (see Table 1) failed to exceed the cut-off point of 0.50 (Hair et al., 2009). Consequently, these items were eliminated. After these refinement procedures, the results of the CFA for the first-order measurement model including both service quality and social impact dimensions indicated an acceptable fit to the data [$\chi^2(323)=616.33$ ($p<.01$); $\chi^2/df=1.90$; CFI=.94; GFI=.92; TLI=.93; RMSEA=.04]. Even though the χ^2 value was significant, its ratio to the degrees of freedom was above the threshold of 3.0 (Kline, 1998). The TLI, CFI, and GFI values were all greater than the threshold of 0.90 for good fit (Hair et al., 2009). Similarly, RMSEA was less than 0.06, suggesting good fit (Byrne, 2000). As shown in Table 1, all items showed acceptable factor loadings, ranging from .55 to .90. The z-values ranged from 9.68 to 25.36 suggesting that the items accurately captured their respective factors (Anderson and Gerbing, 1988). The composite reliability values ranged from .62 to .87 indicating that the constructs were internally consistent (Bagozzi and Yi, 1988). The AVE values were all close to or greater than .50 (Fornell and Larcker, 1981), ranging from .45 to .69.

[Insert Table 1 around here]

Table 2 reports descriptive statistics and correlations among the first-order constructs. For service quality, aesthetic quality had the highest mean value ($M=4.62$, $SD=.68$), while access quality had the lowest mean value ($M=3.71$, $SD=.88$). Regarding social impact, city image and community pride enhancement had the highest mean value ($M=4.37$, $SD=.77$), while social conflicts had the lowest mean value ($M=2.38$, $SD=.97$). Evidence of discriminant validity was accepted since none of the squared correlations exceeded the AVE values for each associated construct (Fornell and Larcker, 1981).

[Insert Table 2 around here]

Subsequently, the analysis of the second-order measurement model indicated also showed an acceptable fit to the data [$\chi^2(365)=720.39$ ($p<.01$); $\chi^2/df=1.97$; CFI=.93; GFI=.91; TLI=.92; RMSEA=.04]. Inspection of the path coefficients between service quality and its associated dimensions (aesthetic quality=.91; complementary events quality=.83, functional quality=.72, access quality=.62, accommodation quality=.56, and technical quality=.54) reveal that all paths were significant at $p<.01$. Similarly, the standardized path coefficients between positive social impact and its associated dimensions (social experiences=.87, city image and community pride enhancement=.81, and public infrastructures=.68), as well as negative social impact and related dimensions (social conflicts=.99 and costs=.24) were all significant ($p<.01$). Overall, the second-order measurement model showed an acceptable fit to the data, and consequently, the structural model was examined.

Structural model

The assessment of the structural model was found to have an acceptable fit [$\chi^2(366)=729.15$ ($p<.01$); $\chi^2/df=1.99$; CFI=0.93; GFI=0.90; TLI=0.92; RMSEA=0.04]. Figure 1 reports the structural relationships in the model highlighting that both hypotheses were supported. The ‘service quality’ construct showed a significant positive relationship with ‘positive social impact’ ($\beta=.79$, $p<.01$) supporting H1. In turn, the path coefficient from ‘service quality’ to ‘negative social impact’ was also significant but negative ($\beta=-.27$, $p<.01$); therefore, H2 was supported. The service quality construct accounted for approximately 63% of the variance of ‘positive social impact’ ($R^2 = 0.63$), and proximately 7% of the variance of ‘negative social impact’ ($R^2=.07$).

[Insert Figure 1 around here]

Discussion and managerial implications

The goal of this study was to examine the relationships between service quality and social impact perceptions at the 2016 Rio de Janeiro Olympic Games. This study contributes to the literature by exploring the importance of service quality on both positive and negative social impacts of the 2016 Rio de Janeiro Olympic Games.

The results indicate that the conceptualisation of service quality based on dimensions of technical, functional, aesthetic, access, accommodation and complementary events was statistically appropriate, indicating that the features of sport mega-events justify a more holistic conceptualization of service quality than those commonly used in previous studies in the sport event setting (e.g., Biscaia et al., 2013; Theodorakis and Alexandris, 2008). It means that service quality assessments at the Olympic Games should capture both the service delivered inside the Olympic sport venues as well as different encounter types in the host city allowing consumer interactions before, during and after the competitions.

The dimensions of *aesthetic* and *complementary events* appear to be paramount for explaining perceptions of service quality in this sport mega-event. That is, perceptions of crowd experience and entertainment within the sports venue and in the host city seem to be critical for consumers when examining the service quality delivered at the 2016 Rio Olympic Games. This is in line with recent studies about sport mega-events hosted in Brazil (Biscaia et al., 2017; Santos et al., 2016) suggesting that the atmosphere of Olympic Games and the provision of new experiences (e.g., Olympic exhibitions, cultural and music festivals) should be taking into consideration by organizing committees when planning the event. In fact, the good atmosphere of the

2016 Rio de Janeiro Olympic Games was mentioned by some event partners in the media, such as the British delegation who highlighted the incredible atmosphere inside the facilities (UOL, 2016). In a similar vein, results from a survey conducted by the Brazilian Government indicated that both national and international visitors were happy with the vibrancy of the event (Ministério do Turismo, 2016). Thus, host cities should strive to create an emotionally appealing atmosphere during the period in which the event takes place. Examples from the 2016 Rio de Janeiro Olympic Games that may have contributed to good perceptions of the ambiance include various social opportunities such as hospitality houses, the Olympic boulevard, wonder harbour and some workshops about the Olympics delivered in local school and universities (e.g., Academic Circuit of Rio 2016 at *Deodoro, Barra* and *Maracanã* region).

The *functional quality* was also an important dimension of service quality. Based on item content, interaction with frontline employees and sense of security inside the sport facilities seem to be very important when consumers assess the quality of service delivery at the Olympic Games. These results are of paramount importance for organizing committees, given that the hosts of Olympic Games have to meet a detailed specification issued by IOC when bidding for the event (Raspaud and Bastos, 2013). The *technical quality* associated with the competitions in the sport venues, as well as the *access quality* and *accommodation quality* within the host city are also important attributes when consumers evaluate service quality of this sport mega-event. Although a great focus in the Olympic Games is (and should be) directed towards the core product (i.e., athlete and team performance), the results of the current study suggest that people are looking to have an overall good service experience that surpasses the competitions inside the field of play. The ‘easy and speed’ for getting to the sport venues and the quality of the accommodation credited by the organizing committee represent important

features of the overall perceived service quality (Shonk and Chelladurai, 2009). It means that an appropriate planning and monitoring of transport infrastructure (i.e., traffic control, public and private transports, shuttles), and local accommodation (e.g., hotels, hostels, lodges) in the host city should be key aspects for the organizing committees of Olympic Games.

The structural equation analysis indicated the predictive efficacy of the service quality construct on both positive and negative social impact, which supports the study hypotheses. Thus, one can argue that a good service delivery perception during the unfolding of the Olympic Games including different encounter types within the sport venues (technical, functional and aesthetic features) and the host city (access and accommodation features and complementary events) contribute for increasing perceptions of positive social impact and reducing perceptions of negative impact. As noted by Hightower et al. (2002), the outcome of a service experience should be evaluated in terms of its utility as well as from an experiential perspective. Also, anecdotal evidence from the 2016 Rio de Janeiro Olympic Games suggest that the event was a motive of pride and a great festive moment due to the acknowledgement of the country's capacity to surpass expectations and deliver such an important event (The Guardian, 2016). For example, every time a Brazilian athlete won a medal, one of the National TV chains exhibited the medal alongside with a music as a way to promote pride and interaction (e.g., dancing) among Brazilian citizens (Globo, 2016). Therefore, hosting a sport mega-event such as the Olympic Games should represent an opportunity for promoting social interaction and cohesion, city pride and infrastructures to better serve the community (Inoue and Havard, 2014; Mao and Huang, 2016).

On the other hand, previous studies have suggested that major events may generate social problems such as traffic congestion, law enforcement strain, increased

crime and price inflation (Gürsoy and Kendall, 2006; Huang et al., 2016; Kim and Petrick, 2005). Considering the results presented in Table 2, *social conflicts* do not seem to have represented a problem for respondents. This may have been related to the strong investment made by the country and the organizing committee in providing high levels of security during the event (CNN, 2016). On the contrary, participants' perception of *costs* (Table 2) seem to be aligned with the sport mega-event literature (e.g., Gürsoy and Kendall, 2006). In addition, it is important to note that the results of the current study seem to support anecdotal evidence indicating that, one year after the 2016 Rio de Janeiro Olympic Games, local residents evaluated the overall quality of the event as being good, but showed concerns about some negative social legacies (Globo, 2017). In this sense, one can reinforce the idea that organizing committees of sport mega-events should be very rigorous when planning and managing public funds and properly explain the social benefits derived from the event to the community (Biscaia et al., 2017).

In summary, understanding perceived social impact of the Olympic Games and its antecedents is paramount for organizing committees and host cities. The results of the current study suggest that ensuring a high standard of service quality during the event contributes for increasing perceived positive social impact and reducing perceived negative social impact among residents who attended the event.

Limitations and future research

This study, as with any, has limitations that should be acknowledged and taken into consideration for future research. First, data were collected in the surroundings of only three sport venues including the Olympic Stadium (athletics), *Maracanã* (soccer) and *Maracanazinho* (volley). To this end, the sample may not be representative of all consumers of the 2016 Rio de Janeiro Olympic Games. Additional studies about sport

mega-events should try to gather participant data from all Olympic sport facilities in order to further clarify how perceptions of service quality contribute to perceived social impacts.

Second, even though the *access quality* dimension was based on previous empirical studies conducted with local communities (Shonk and Chelladurai, 2009), this variable showed low convergent validity. Future studies should re-examine and refine this dimension through the inclusion of new items related to road quality and parking areas in the Olympic city (Getz, 1997). Similarly, the construct validity of *social conflicts* and *costs* suggests the need for scale refinement in future research. This could be done by incorporation items related to disruption of daily life (Liu, 2016) and increased the tax burden for locals (Pillay and Bass, 2008), respectively.

Third, residents' opinions about sport mega-events may change over time (Biscaia et al., 2017). The current study is cross-sectional and previous research suggest that social impact requires time axis (Balduck et al., 2011). Thus, future studies could try to collect data using a longitudinal approach (before, during and after the event takes place) in order to better understand service quality and its effects on perceived social outcomes. This may be particularly important for countries intending to bid for hosting future mega-sport events.

Fourth, even though the 2016 Rio de Janeiro Olympic Games were subject to great criticism among the population (Globo, 2017), the vast majority of the participants in this study were favourable to host the event suggesting caution when interpreting the results. While the current study did not control participants' opinions about hosting the event due to limited number of individuals within the sample who were against this event (9.8%), future studies should collect larger and more balanced samples, and participants from different regions (Santos et al., 2016) to better understand the social

outcomes of sport mega-events among the population. In addition, previous studies suggest that sociodemographic characteristics tend to influence perceptions of sport mega-events (Ritchie et al., 2009). As such, additional research could investigate event quality and social impact perceptions based on different sociodemographic profiles (e.g., economic status, gender or education). Furthermore, the inclusion of different stakeholders of the Olympic Games (e.g., volunteers, athletes, local partners and global sponsors) in the evaluation of service quality and social impact perceptions may prove to be important in future research endeavours. Finally, despite the results of the current study suggest that increased perceptions of service quality contribute to perceived positive social impact, there are recent anecdotal evidence in Rio de Janeiro highlighting actual negative social impacts such as the lack of maintenance and devastation of many sport facilities (e.g., Maracanã Stadium and Aquatic Stadium) (CNN, 2017). To this end, future research should use both perceptions of social impact and objective measures collected in different moments in time to better understand the linkages between service quality delivery and social impact of sport mega-events.

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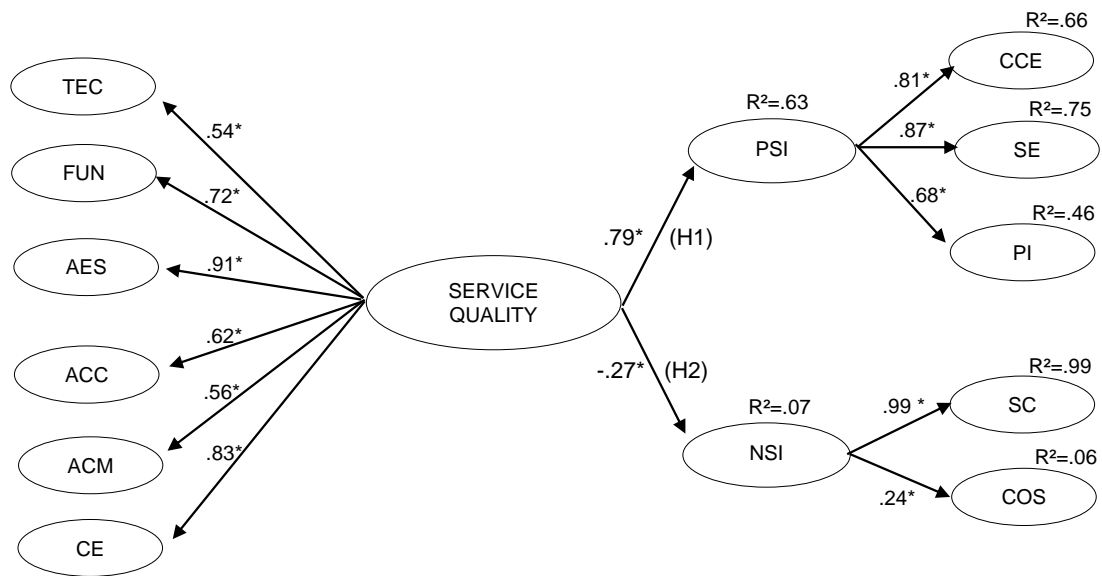
Table 1 - Factor loadings, z-values, composite reliability (CR) and average variance extracted (AVE) for the dimensions of the service quality and social impact.

Constructs/Items	λ	Z	CR	AVE
<i>Technical quality</i>			.66	.50
The athletes in the Olympic Games are excellent.	.663	11.82		
The referees correctly apply the rules of the games	.736	12.56		
There is competitiveness in the Olympic Games ^a	-	-		
<i>Functional quality</i>			.73	.58
The employees in the Olympic Games respond quickly to my needs	.761	17.08		
There is a sense of security in the Olympic facilities.	.762	17.10		
The Olympic volunteers provide a good service ^a	-	-		
<i>Aesthetic quality</i>			.70	.53
During games, the crowd experience is amazing	.713	16.66		
Attending the Olympic Games live is a great entertainment.	.740	17.33		
Attending the Olympic Games live allows me to engage with people ^a	-	-		
<i>Access quality</i>			.71	.45
It is easy to get to the facilities of the Olympic Games.	.754	16.35		
Traveling to Rio de Janeiro for attending the Olympic Games is easy.	.594	12.40		
The accessibilities in the city allows me to easily get the any place	.655	14.24		
<i>Accommodation quality</i>			.87	.69
In the accommodations recognized by the Olympic Games (e.g. hotel, hostel, etc.), the staff delivers the services/requests effectively.	.683	17.00		
The rooms at the accommodations recognized by the Olympic Games (hotel, hostel, etc.) are comfortable.	.888	24.57		
The accommodations recognized by the Olympic Games are good.	.907	25.36		
<i>Complementary events quality</i>			.78	.54
The complementary events (e.g., cultural shows, dance exhibitions) in the city generated a good atmosphere.	.729	17.54		
The complementary events (e.g., cultural shows, dance exhibitions) in the city are appealing.	.734	17.74		
The complementary events during (e.g., cultural shows, dance exhibitions) in the city are of great quality.	.748	18.12		
<i>City image and community pride enhancement</i>			.68	.52
Improved image of Rio de Janeiro	.715	14.27		
Enhanced recognition of Rio de Janeiro internationally	.720	14.34		
Enhanced pride of Rio de Janeiro residents ^a	-	-		
<i>Social experiences</i>			.79	.50
Reinforced cohesion of Rio de Janeiro community	.707	16.92		
Promoted the cultural diversity of Rio de Janeiro	.690	16.33		
Provided residents with the chance to meet new people	.691	16.34		
Brought good emotional experiences to one's life	.710	16.96		
<i>Public infrastructures</i>			.68	.51
Upgrading of public transportation in Rio de Janeiro	.674	13.56		
Improvement of sport facilities in Rio de Janeiro	.676	13.58		
Enhancement of general infrastructure in Rio de Janeiro ^a	-	-		
<i>Social conflicts</i>			.77	.47
Deteriorated social order in Rio de Janeiro	.752	17.87		
Increased traffic accidents	.583	13.04		
Increased alcohol consumption and vandalism	.550	12.71		
Increased crimes in the local community	.818	19.67		
<i>Costs</i>			.63	.47
Exceeded the use of government financial resources	.563	9.70		
Led to higher price levels	.791	10.66		

^a Item eliminated after scale refinement.

Model fit: $\chi^2(323)=588.65$ ($p<.01$); $\chi^2/df=1.82$; CFI=.95; GFI=.92; TLI=.94; RMSEA=.04.

Figure 1 – Summary of the structural model results.



Note: $\chi^2(366)=729.15$ ($p<.01$); $\chi^2/df=1.99$; CFI=0.93; GFI=0.90; TLI=0.92; RMSEA=0.04; * $p<.01$

Table 2 - Mean (M), standard deviation (SD) and correlations among constructs.

Construct	M(SD)	Correlation Matrix											
		TEC	FUN	AES	ACC	ACC	CE	CCE	SE	PI	SC	COS	
Technical quality (TEC)	4.12(.83)	1.00											
Functional quality (FUN)	4.28(.83)	.20	1.00										
Aesthetic quality (AES)	4.62(.68)	.30	.51	1.00									
Access quality (ACC)	3.71(.88)	.06	.28	.30	1.00								
Accommodation quality (ACM)	4.11(.86)	.07	.14	.19	.14	1.00							
Complementary events quality (CE)	4.26(.73)	.18	.28	.50	.26	.36	1.00						
City image and community pride enhancement (CCE)	4.37(.77)	.09	.25	.36	.14	.05	.31	1.00					
Social experiences (SE)	4.34(.72)	.13	.21	.46	.14	.12	.35	.47	1.00				
Public infrastructure (PI)	3.95(.99)	.14	.07	.13	.13	.08	.25	.33	.35	1.00			
Social conflicts (SC)	2.38(.97)	.02	.01	.09	.02	.00	.04	.11	.05	.05	1.00		
Costs (COS)	4.10(.98)	.00	.02	.02	.00	.01	.01	.00	.00	.02	.02	1.00	

TEC = Technical quality; FUN = Functional quality; AES = Environmental quality; ACC= Access quality; ACM =Accommodation quality; CE = Complementary events quality; CE = City image and community pride enhancement; SE = Social experiences; PI = Public infrastructures; SC = Social conflicts; COS = Costs.

No correlations failed the AVE test of discriminant validity.