

# Now what? An assessment of perceived legacies post-Olympic cycle

Perceptions  
of Olympic  
legacies

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Received 19 January 2023

Revised 9 June 2023

Accepted 23 June 2023

## Abstract

**Purpose** – The purpose of this study is to examine the post-event perceptions of Rio de Janeiro residents regarding the legacies left to them from hosting the 2016 Olympic Games. Additionally, this study examines how perceptions of Olympic legacies differed amongst demographic groups.

**Design/methodology/approach** – Utilizing a mixed-methods approach, participants were asked to complete a survey questionnaire and answer three open-ended questions. An adapted version of Fredline *et al.* (2003)'s General Scale to Measure Social Impacts (GSMIS) was selected for this study. In total, 156 useable responses were collected. An exploratory factor analysis was utilized for the survey items while the three open-ended questions were coded abductively as positive, negative or mixed feelings.

**Findings** – The quantitative results shows that Rio residents believe that hosting the 2016 Olympic Games had a mostly negative impact on their perception of legacies. Through reading open-ended responses, participants expressed disappointment over the legacies left to them. These findings suggest that hosting the Olympic Games may not have been beneficial to the life of Rio de Janeiro residents, and it may have been particularly worse for members of the middle class.

**Originality/value** – Due to the recency of the Rio 2016 Olympic Games, a few studies have explored the long-term legacies left to the local population. However, the uniqueness of this study lays on the perceptions of legacies from hosting the Rio 2016 after a full Olympic cycle has passed.

**Keywords** Olympic games, Rio 2016, Legacy, Resident perceptions, Mega-sport events

**Paper type** Research paper

## Background/introduction

In contrast with the celebrations that took place when the 2016 Olympic Games were awarded (Canedo and Morais, 2009), protests broke out in the lead up to the Games at Copacabana Beach regarding the legitimacy of office takeover of then President Michel Temer, the overspending of public resources and the lack of consideration towards low-income communities (Phillips, 2016). Only seven weeks before the opening ceremony, Rio de Janeiro declared a “state of calamity” due to cost overruns (Chade, 2017, p. 139). In South America-but specially in Brazil – corruption, social problems and public scepticism towards the



The first author would like to thank his doctoral advisor (Dr. Haylee Mercado) and Dr. Allison D. Anders for their help throughout the final stages of this manuscript.

Since acceptance of this article, the following author(s) have updated their affiliation(s): Dr. Robert Turick is at the National Collegiate Athletic Association (NCAA).

International Journal of Event and  
Festival Management

© Emerald Publishing Limited

1758-2954

DOI 10.1108/IJEFM-01-2023-0004

government is a problem dating back to the colonial times when European explorers first arrived in the turn of the sixteenth century to explore local resources and exploit the local indigenous population (Poets, 2021). According to the official bid document, “Rio 2016’s bid plan forms part of the Brazilian Government’s vision to invest in sport as a catalyst for social integration” (IOC, 2009, p. 46). However, previous studies have found that Rio residents only moderately supported the 2016 Olympic Games since they “seemed a little skeptical of the government work and positive legacies for the country” (Rocha *et al.*, 2017, p. 251).

According to Chappelet (2019), there is not a set timeframe to evaluate mega-event legacies. Previous studies examining mega-event impacts have typically been conducted only four months after an event (Koenigstorfer *et al.*, 2019). Since the Olympic Games provides the host city and the host country with a unique opportunity to reshape its image locally and abroad, it is important to investigate resident perceptions of mega-event legacies “at longer post-event intervals to provide valuable information related to the activation of legacy plans, as well as the manifestation of both negative and positive unplanned legacies” (Koenigstorfer *et al.*, 2019, p. 741). Therefore, the uniqueness of this study lays on the analysis of resident perceptions of legacies of a mega-event (i.e. 2016 Olympics), hosted in a mega-city (i.e. Rio de Janeiro) in the global south (i.e. South America), after one full Olympic cycle has concluded. The implications of this study can provide mega-sport event organizers, future bidding cities and their residents with an enhanced understanding of the potential long-term impacts a mega-event can have upon its residents.

## Review of literature

### *Setting the stage*

The announcement of Rio de Janeiro marked the first time a country in South America was selected to host the Olympic Games, which furthers a trend of emerging countries (i.e. BRICS) being awarded the rights to host the Games in recent editions (Liu *et al.*, 2014). Three of the BRICS members hosted a Summer or Winter Olympic Games since the turn of the century (i.e. Beijing 2008; Sochi 2014; Rio 2016; Beijing 2022). Emerging countries often choose to host the Olympic Games because they consider hosting mega-events as their “coming out party” into the world stage (Carter, 2011; Grix and Kramareva, 2017). In the case of Brazil, it was no different. According to Tomlinson *et al.* (2011), hosting mega-events was seen by Brazilian political leaders as a great “opportunity to present the country as an emerging power” (p. 39) to the world.

In the Rio 2016 bid document (IOC, 2009), it is stated that “the Brazilian authorities believe that Rio de Janeiro’s bid is a ‘self-affirmation’ of the Brazilian people and consider it a point of honor to bring the Games to the country and to South America” (p. 46). However, researchers have argued that the chance of “setting the best foot forward” have been ravaged for Brazil, since low income communities were forcefully expelled from their houses to give space for Olympic related infrastructure (Williamson, 2017), while companies implicated in the Lava Jato (i.e. Car Wash) corruption scheme were found to be contractors for building the Rio 2016 Olympic Village as well as other infrastructure projects such as the *Porto Maravilha* (Boykoff, 2017; Gaffney, 2016).

Previous scholars have warned that mega-events have typically been used to leverage the host city to invest public funds into multimillion dollar contracts that will result in long-term debt and bring negative consequences (e.g. increase in taxes, inflation, etc.) upon the host city and its residents (Andranovich *et al.*, 2001; Koba *et al.*, 2021). In the case of emerging countries, hosting the Olympic Games means that public funds are likely being taken away from other vital sectors: such as education, health and housing (Kasimati, 2003). The 2016 Olympic Games had an estimated investment of more than \$20bn USD (Zimbalist, 2017), “surpassing by nearly 50% ... [what] Rio spends on education and health services in a typical year” (Chade, 2017, p. 139). Due to the immense financial investment necessary to host mega-sport events, local politicians and event organizers in emerging countries “play an even more

important role due to larger opportunity costs" (Rocha, 2016, p. 488). Consequently, event legacy should be a priority of mega-event organizers since "mega-sporting events, such as the Olympics, could serve to exacerbate social problems and deepen existing divides among residents" (Malfas *et al.*, 2004, p. 213).

### *Mega-event legacies*

Despite arguments regarding the impacts mega-events can cause, Horne (2007) stated that there are two common features of all mega-events: "first, that they are deemed to have significant consequences for the host city, region, or nation in which they occur, and second, that they will attract considerable media coverage" (p. 82). According to the literature, mega-events generate both positive and negative outcomes (Horne, 2007; Preuss, 2007). Often, mega-event organizers and politicians justify hosting the event by overestimating benefits, in which many of them proclaim economic boosts, improved social indicators, promotion of international trade, an improved global image of the city/nation, enhanced transportation and sporting infrastructures, increased security, environmental changes and national pride (Bondarik *et al.*, 2020). On the other hand, academic researchers have concluded that there are "significant gaps between forecast and actual outcomes, between economic and non-economic rewards, between the experience of mega-events in advanced and in developing societies" (Horne, 2007, p. 85).

To Matheson and Baade (2004), mega-event impacts should be perceived differently from developed nations to emerging ones. They argued that the cost of infrastructure is likely to be higher in developed than in emerging countries. Also, "industrialized nations tend to be able to attract larger numbers of fans to mega-events than developing nations" (p. 18), and post-event usage of sport infrastructure "will likely be lower in developing nations than in developed nations" (p. 17). However, due to the recency of emerging countries being selected to host mega-events, the literature on the long-term impacts of hosting mega-events in developing countries is relatively new and scarce. As Horne (2007) explained, "the 'legacies' - whether social, cultural, environmental, political, economic or sporting - are the 'known unknowns' of sports mega-events" (p. 86). Thus, there is still a necessity to understand the long-term impacts of hosting mega-events, especially on developing/emerging countries, such as Brazil.

### *Residents perceptions*

Thomson *et al.* (2019), shows through a systematic literature review that "sport event legacy" articles published in peer-reviewed journals have substantially increased between 2007 and 2016. Meanwhile, Koenigstorfer *et al.* (2019) noted that empirical studies of mega-event legacies focusing on resident perception are the most prominent in the current literature, while less than one-fifth of empirical studies about mega-event legacies utilized a mixed-method approach. According to Koenigstorfer *et al.* (2019), previous studies have shown a tendency of looking at event legacy through an economic or social lens. Fredline *et al.* (2003) argued that because event impacts can be difficult to measure objectively, residents' perception of impacts can be a good approach when evaluating event legacy. Since the turn of the century, Rio has hosted three mega-sport events: the 2007 Pan-American Games, the 2014 FIFA World Cup and the 2016 Olympic Games. Although it is a challenge to determine when the impacts and legacies from hosting one event stops and the impacts and legacies from another event starts, Gaffney (2019) pointed out how Rio de Janeiro's decade long mega-event pursuit have left them four major consequences: (a) consolidation of consumer sovereignty, (b) restructuring of urban circulations, (c) financialization of urban territories and (d) the securitization of exception (p. 268). The consequences mentioned by Gaffney (2019) highlight how policy makers and members of the elites leverage mega-events to create an urban agenda driven by the interest of a few.

Previous research about Rio 2016 have looked at resident perception of social impacts pre and post-event (Ribeiro *et al.*, 2020), the relationship between legacies and support (Rocha,

2020) and about Rio's gentrification process due to the hosting of mega-events (Gaffney, 2016). Both Ribeiro *et al.* (2020), as well as Rocha (2020) leaned on the concept of social exchange theory to analyze resident perception of legacies. In their analysis, Ribeiro *et al.* (2020) found that resident perception of legacies can change over time as positive perceptions improved, while negative perceptions decreased from pre to post-Games. However, Ribeiro *et al.* (2020)'s findings cannot be interpreted without acknowledging the proximity of the data collection period to the start and end of the 2016 Olympic Games. As time passes by, locals' euphoria from having hosted the Olympic Games is likely to fade away as evidence of legacies arise (Rocha, 2020). As highlighted by Gaffney (2019), "mega-events do not end at the final whistle – in many senses they only then begin" (p. 267). To address such challenge, Rocha (2020) conducted a longitudinal study and found that Rio de Janeiro resident perception of legacies and support for the 2016 Olympic Games decreased from 2012 to 2018. Rocha (2020) attributes this decrease to "organizers promise [of] unattainable legacies, which then lead to dwindling support, as they fail to deliver them" (p. 130). While the aforementioned studies have many similarities to this, none of them were conducted after a full Olympic cycle has passed. Therefore, this examination seeks to contribute to the literature by enhancing the understanding of the resident perceptions of mega-event legacies hosted in South America post-Olympic cycle. The case of Rio de Janeiro was chosen for this analysis because of the socio-economic importance of Brazil to South America.

### Theoretical foundation: social exchange theory

Social Exchange Theory (SET) has been commonly utilized by scholars to illustrate the impacts hosting the Olympics could have upon residents' perceptions of legacies (Rocha, 2020). Homans (1958) viewed SET as a concept of social behavior dictated by the exchange between parties. Such theory has been applied in a variety of academic disciplines (Cropanzano and Mitchell, 2005). In the case of mega-events, exchange occurs between residents and mega-event organizers when organizers promise positive legacies in exchange for resident's investment and support of the Games (Rocha, 2020). As such, mega-event organizers must leverage Olympic legacies to have resident's support for future events (Ribeiro *et al.*, 2020). So far, little is known regarding the long-term resident perceptions of such social exchange.

Homans (1958) explained that "persons that give much to others try to get much from them, and persons that get much from others are under pressure to give much to them" (p. 606). Therefore, when considering the position of those responsible for the decision-making process of the Olympic Games, they are under pressure to give back to those who provided substantially higher investments for the implementation of the Olympic Games. Such a select group usually includes rich investors, hotel and leisure operators, team owners, professional sports teams, local universities, construction firms and others from the upper socio-economic class (Andranovich *et al.*, 2001). To that matter, this study leans on the foundation of SET to analyze the case of the Rio 2016 Olympic legacy. From a theoretical standpoint, examining the perception of legacies from residents can contribute to a better understanding of the long-term social exchanges from hosting a mega-event in the global south (Ribeiro *et al.*, 2020).

### Methods

The purpose of this study is twofold. First, the primary purpose of this study is to understand how Rio residents perceive the legacies left from hosting the 2016 Olympic Games after a full Olympic cycle. The findings of the current study also discussed how resident perceptions have changed over time compared to previous studies conducted in closer proximity to the

Games (e.g. [Rocha, 2020](#); [Ribeiro et al., 2020](#); [Zouain et al., 2019](#)). Due to the lack of studies that have been conducted after a full Olympic cycle, especially regarding the Rio 2016, this study seeks to fill such literature gap. A secondary purpose of this study is to examine how perceptions differ among demographic groups (i.e. age, gender, employment status and social class). Social classes were determined based on Brazilian Institute of Geography and Statistics (IBGE) and the *Faculdade Getulio Vargas* (FGV) division of socio-economic classes from A to E, with A being the wealthiest and E the poorest ([Ribeiro et al., 2020](#)). Based on the number of respondents, Classes D & E were combined to represent the lower class, Class C represents the middle class and Classes A & B were combined to represent the upper class.

### *Research design*

This study utilized a mixed methods approach in which participants were asked to complete a survey questionnaire and answer three open-ended questions. The three open-ended questions were added to enhance and clarify the findings of the survey instrument ([Wisdom et al., 2012](#)). Survey items were analyzed using an exploratory factor analysis while the three open-ended questions were coded abductively as either positive, negative or mixed feelings responses. The research team chose an adapted version of [Fredline et al. \(2003\)](#)'s General Scale to Measure Social Impacts (GSMI) as the survey instrument for this study. Participants were asked to rate how much their lives worsened or improved since hosting the 2016 Olympic Games using a 7-point scale.

Our survey was developed in English and then translated into Portuguese – Brazil's native language. Two native Brazilians working in universities within the United States assisted in confirming the accuracy of the translations made by the principal investigator of this study. The survey was disseminated using Qualtrics. Due to the coronavirus pandemic, collecting data via online surveys was necessary to ensure the safety and well-being of the participants and researchers. Data was collected through online platforms as participants were reached via email, referrals and/or social media posts. A snowball and convenience sampling were utilized for this study. The data collection process occurred over three months between March 2021 and May 2021, which was the lead up period to the subsequent Summer Olympic Games hosted in Tokyo that began in July of 2021.

### *Participants and recruitment*

The population of interest for our study was Rio residents that were present before, during and after the Olympic Games took place. Participants were required to be at least 18 years of age, a Rio de Janeiro resident (continuously since January 2016) and be fluent in written Portuguese. Survey dissemination occurred in two ways. First, the principal investigator contacted Rio de Janeiro residents and asked them to complete the survey and/or share via their social media platforms. Posts were disseminated on social networks and made available to Facebook groups originated and/or based in Rio de Janeiro. All participants were asked to read an informed consent form and a short statement explaining the study's rationale.

### *Instruments*

In an effort to shorten the survey for this study – with the hope that doing so would lead to more completed surveys – only 29 items from [Fredline et al. \(2003\)](#)'s GSMI were included in the survey instrument; two more items were added based on the mega sporting event literature. The final instrument included five basic demographic questions, three open-ended questions and 31 quantitative items adapted from [Fredline et al. \(2003\)](#), in which participants were asked to rate if those items worsened or improved after the realization of the Olympic Games. Thus, the final survey instrument contained a total of 39 items/questions. The questionnaire was designed to take between 7 and 10 min.

## Results

After three months of data collection, 191 total responses were received. After removing incomplete surveys and responses from participants that did not meet the inclusion criteria, a total of 156 total useable responses ( $N = 156$ ) remained. Based on an effect size of 0.30 with an alpha level of 0.05, the G Power software showed a power level of 0.92. Many researchers agree that 0.80 is the minimum acceptable power level (Parks *et al.*, 1999), thus our sample size was deemed appropriate for this analysis. The survey was completed by a slightly higher number of females ( $n = 82$ ; 52.6%) than males ( $n = 73$ ; 46.8%). Respondents were mostly middle-aged individuals (i.e. between 40 and 59 years old) as 81 ( $n = 81$ ; 51.9%) participants fell into that group, young adults (i.e. between 18 and 39 years old) made up the second largest group ( $n = 48$ ; 30.8%) and the smallest age group ( $n = 27$ ; 17.3%) comprised older individuals (i.e. 60 years or older).

The majority of participants in this study were employed ( $n = 54$ ; 34.6%), followed by self-employed individuals ( $n = 32$ ; 20.5%), students ( $n = 22$ ; 14.1%), retirees ( $n = 14$ ; 9.0%), unemployed individuals ( $n = 7$ ; 4.5%) and participants in the “other” category ( $n = 27$ ; 17.3%). Examples of employment statuses that fall under “other” include, but are not limited to: athletes, home-office workers, military members, etc. The final demographic category was monthly income. The lower class (i.e. those who made less than R\$4,400 per month) made up 29.5% of the responses ( $n = 46$ ), the middle class (i.e. those who made between R\$4,400 and R\$11,000) made up 31.4% of the responses ( $n = 49$ ), while the upper class (i.e. those who made more than R\$11,000 per month) made up 37.2% of the responses ( $n = 58$ ). Three individuals ( $n = 3$ ; 1.9%) chose not to answer this question.

### *Descriptive statistics*

A total of 31 ( $N = 31$ ) items comprised our survey. All items were measured using a 7-point scale and were scored from “1 = extremely worsened” to “7 = extremely improved”. Thus, items that had a mean score above four indicated a positive perception of that item, while items that had a mean score below four indicated a negative perception. Of note, items that equaled or were close to four indicated indifference/neutrality (i.e. no change). Descriptive statistics for all 31 items are shown in Table 1.

A review of the descriptive statistics shows that the three highest mean scores were: “opportunities to meet new people” ( $M = 4.71$ ,  $SD = 1.43$ ), “the media coverage of the event promoted tourism and business development in the city of Rio de Janeiro” ( $M = 4.59$ ,  $SD = 1.60$ ) and “the event promoted the image of the city” ( $M = 4.48$ ,  $SD = 1.65$ ). Meanwhile, the three lowest mean scores were: “overall cost of living” ( $M = 2.12$ ,  $SD = 1.23$ ), “the government rationale/competence with the use of public funds towards the event” ( $M = 2.18$ ,  $SD = 1.44$ ), and “social inequality” ( $M = 2.32$ ,  $SD = 1.41$ ). Of note, 24 of the 31 items (77%) had mean scores lower than four, which largely demonstrates that Rio de Janeiro residents believe hosting the 2016 Olympic Games had mostly a negative impact on their life. It is worth mentioning that even the highest mean score, “opportunities to meet new people” ( $M = 4.71$ ,  $SD = 1.43$ ), was only perceived by residents as being in-between “indifferent” to “slightly improved”. Furthermore, 11 of the 31 items (35%) had a mean score below three, which means that those areas were perceived as in between “slightly worsened” and “worsened”.

### *Factor analysis*

Upon executing the initial rotation, seven components were retained based on the Kaiser-Guttman rule that all components with Eigen values greater than one should be retained. The cumulative percentage of variance explained by the seven components equaled 66.23%. The decision to retain seven components was also reaffirmed by the Screen Plot that was generated in the SPSS Output. The second rotation of the data utilized the Promax method



| Survey items                                                                                             | M    | SD   | Perceptions<br>of Olympic<br>legacies                         |
|----------------------------------------------------------------------------------------------------------|------|------|---------------------------------------------------------------|
| Opportunities to meet new people                                                                         | 4.71 | 1.43 |                                                               |
| The media coverage of the event promoted tourism and business development in the city of Rio de Janeiro  | 4.59 | 1.60 |                                                               |
| The event promoted the image of the city                                                                 | 4.48 | 1.65 |                                                               |
| The event entertained local residents and gave them an opportunity to attend a major international event | 4.44 | 1.43 |                                                               |
| The event provided opportunities for family-friendly activities                                          | 4.35 | 1.34 |                                                               |
| Pride that residents have in their city                                                                  | 4.10 | 1.81 |                                                               |
| Opportunities for local business                                                                         | 4.03 | 1.50 |                                                               |
| Appearance of the city                                                                                   | 3.73 | 1.92 |                                                               |
| The rights and civil liberties of local residents                                                        | 3.63 | 1.30 |                                                               |
| The event promoted values that are good                                                                  | 3.46 | 1.45 |                                                               |
| Public transportation                                                                                    | 3.44 | 1.95 |                                                               |
| Noise levels                                                                                             | 3.32 | 1.29 |                                                               |
| Traffic congestion in/around the city                                                                    | 3.24 | 1.69 |                                                               |
| Environmental changes                                                                                    | 3.22 | 1.41 |                                                               |
| Excessive drinking and/or drug abuse since the event ended                                               | 3.21 | 1.23 |                                                               |
| Availability of Olympic venues for use by local residents                                                | 3.15 | 1.75 |                                                               |
| Parking availability in/around the city                                                                  | 3.13 | 1.45 |                                                               |
| Employment opportunities                                                                                 | 3.10 | 1.71 |                                                               |
| The money spent on the event helped to stimulate the economy                                             | 3.05 | 1.83 |                                                               |
| Public safety/security                                                                                   | 3.04 | 1.72 |                                                               |
| The event listened to residents' requests and interests                                                  | 2.97 | 1.39 |                                                               |
| The impact the event had on the stress level of residents                                                | 2.86 | 1.52 |                                                               |
| Personal/Family income level                                                                             | 2.85 | 1.47 |                                                               |
| Litter in/around the city                                                                                | 2.84 | 1.56 |                                                               |
| Property values in the city                                                                              | 2.82 | 1.70 |                                                               |
| Crime levels                                                                                             | 2.63 | 1.50 |                                                               |
| Rowdy and delinquent behavior                                                                            | 2.61 | 1.31 |                                                               |
| Maintenance of public facilities                                                                         | 2.49 | 1.59 |                                                               |
| Social inequality                                                                                        | 2.32 | 1.42 |                                                               |
| The government rationale/competence with the use of public funds towards the event                       | 2.18 | 1.44 |                                                               |
| Overall cost of living                                                                                   | 2.12 | 1.23 |                                                               |
| <b>Source(s):</b> Author's own creation/work                                                             |      |      | <b>Table 1.</b><br>Descriptive statistics<br>for survey items |

and requested seven factors to be extracted. The displayed coefficients for each factor were sorted by size and all coefficients below 0.4 were suppressed. The Promax rotation converged in eight iterations. The results showed that 29 of the 31 items loaded onto the seven components. The two items that did not load into any factor were “the event listened to residents' requests and interests” and “social inequality”.

Factor one was comprised of the seven items and was named “*Tourism Effects*”. Its Cronbach's alpha was 0.876. Factor two was comprised of five items and was named “*Inconvenience and Stress*”. Its Cronbach's alpha was 0.788. Factor three was comprised of three items and was named “*Safety and Security*”. Its Cronbach's alpha was 0.817. Factor four was comprised of six items and was named “*Social Impacts*”. Its Cronbach's alpha was 0.858. Factor five was comprised of three items and was named “*Behavioral Outcomes*”. Its Cronbach's alpha was 0.767. Factor six was comprised of three items and was named “*Financially Worthwhile*”. Its Cronbach's alpha was 0.636. Factor seven was comprised of two items and was named “*Economic Impacts*”. Its Cronbach's alpha was 0.637 (see [Table 2](#)).

[Bland and Altman \(1997\)](#) noted that when comparing groups in non-clinical settings, alpha values of 0.7–0.8 are regarded as satisfactory. Interestingly, [Taber \(2018\)](#) highlighted

Table 2.  
Factor loading table

| Items                                                                                                    | Factor 1<br>Tourism<br>effects | Factor 2<br>Inconvenience and<br>stress | Factor 3<br>Safety and<br>security | Factor 4<br>Social<br>impacts | Factor 5<br>Behavioral<br>outcomes | Factor 6<br>Financially<br>worthwhile | Factor 7<br>Economic<br>impacts |
|----------------------------------------------------------------------------------------------------------|--------------------------------|-----------------------------------------|------------------------------------|-------------------------------|------------------------------------|---------------------------------------|---------------------------------|
| <i>Eigenvalue</i>                                                                                        | 11.12                          | 2.97                                    | 1.63                               | 1.36                          | 1.24                               | 1.16                                  | 1.06                            |
| <i>% of variance explained</i>                                                                           | 35.86%                         | 9.59%                                   | 5.25%                              | 4.39%                         | 3.99%                              | 3.75%                                 | 3.42%                           |
| The event promoted the image of the city                                                                 | 0.821                          |                                         |                                    |                               |                                    |                                       |                                 |
| Pride that residents have in their city                                                                  | 0.765                          |                                         |                                    |                               |                                    |                                       |                                 |
| Opportunities to meet new people                                                                         | 0.762                          |                                         |                                    |                               |                                    |                                       |                                 |
| The media coverage of the event promoted tourism and business development in the city of Rio de Janeiro  | 0.751                          |                                         |                                    |                               |                                    |                                       |                                 |
| The event promoted values that are good Opportunities for local business                                 | 0.716                          |                                         |                                    |                               |                                    |                                       |                                 |
| The event entertained local residents and gave them an opportunity to attend a major international event | 0.704                          |                                         |                                    |                               |                                    |                                       |                                 |
| Noise levels                                                                                             | 0.683                          |                                         |                                    |                               |                                    |                                       |                                 |
| The impact the event had on the stress level of residents                                                |                                | 0.927                                   |                                    |                               |                                    |                                       |                                 |
| Traffic congestion in/around the city                                                                    |                                | 0.768                                   |                                    |                               |                                    |                                       |                                 |
| The rights and civil liberties of local residents                                                        |                                | 0.664                                   |                                    |                               |                                    |                                       |                                 |
| Parking availability in/around the city                                                                  |                                | 0.646                                   |                                    |                               |                                    |                                       |                                 |
| Public safety/security                                                                                   |                                | 0.410                                   |                                    |                               |                                    |                                       |                                 |
| Crime levels                                                                                             |                                |                                         | 0.828                              |                               |                                    |                                       |                                 |
| Environmental changes                                                                                    |                                |                                         | 0.826                              |                               |                                    |                                       |                                 |
| Public transportation                                                                                    |                                |                                         | 0.555                              |                               |                                    |                                       |                                 |
| Appearance of the city                                                                                   |                                |                                         |                                    | 0.804                         |                                    |                                       |                                 |
| Employment opportunities                                                                                 |                                |                                         |                                    | 0.796                         |                                    |                                       |                                 |
| Availability of Olympic venues for use by local residents                                                |                                |                                         |                                    | 0.691                         |                                    |                                       |                                 |
| The event provided opportunities for family-friendly activities                                          |                                |                                         |                                    | 0.612                         |                                    |                                       |                                 |
| Maintenance of public facilities                                                                         |                                |                                         |                                    | 0.444                         |                                    |                                       |                                 |
|                                                                                                          |                                |                                         |                                    | 0.410                         |                                    |                                       |                                 |

(continued)



| Items                                                                                | Factor 1<br>Tourism<br>effects | Factor 2<br>Inconvenience and<br>stress | Factor 3<br>Safety and<br>security | Factor 4<br>Social<br>impacts | Factor 5<br>Behavioral<br>outcomes | Factor 6<br>Financially<br>worthwhile | Factor 7<br>Economic<br>impacts |
|--------------------------------------------------------------------------------------|--------------------------------|-----------------------------------------|------------------------------------|-------------------------------|------------------------------------|---------------------------------------|---------------------------------|
| Excessive drinking and/or drug abuse since the event ended                           |                                |                                         |                                    |                               | 0.877                              |                                       |                                 |
| Litter in/around the city                                                            |                                |                                         |                                    |                               | 0.662                              |                                       |                                 |
| Rowdy and delinquent behavior                                                        |                                |                                         |                                    |                               | 0.548                              |                                       |                                 |
| Property values in the city                                                          |                                |                                         |                                    |                               |                                    | 0.730                                 |                                 |
| The government's rationale/competence with the use of public funds towards the event |                                |                                         |                                    |                               |                                    | 0.633                                 |                                 |
| The money spent on the event helped to stimulate the economy                         |                                |                                         |                                    |                               |                                    | 0.539                                 |                                 |
| Overall cost of living                                                               |                                |                                         |                                    |                               |                                    |                                       | 0.752                           |
| Personal/family income levels                                                        |                                |                                         |                                    |                               |                                    |                                       | 0.652                           |
| <b>Source(s):</b> Author's own creation/work                                         |                                |                                         |                                    |                               |                                    |                                       |                                 |

Table 2.

how researchers have consistently interpreted alpha values differently, with values in the 0.6 range routinely being scored as “adequate”, “moderate” and “satisfactory”. This may be because a low alpha level is sometimes just the result of only using a few items (Tavakol and Dennick, 2011). To that end, the alpha values for our factors were deemed acceptable for analysis.

Demographic comparisons

The research questions aimed to determine if demographic variables impacted perceptions of the 2016 Rio Summer Olympic Games. To that matter, *t*-tests (Gender) and ANOVAs (age, employment status and monthly income) were run to identify statistically significant group differences on the aforementioned seven factors (see Table 3 and Table 4). In terms of group differences on “employment status”, the factor “Behavioral Outcomes’ [ $F(4,151) = 3.368, p = 0.011$ ] was the only one that was statistically different. A review of the Tukey Post Hoc tests found that differences occurred between students ( $M = 10.78, SD = 3.39$ ) and employed ( $M = 8.03, SD = 2.94$ )/self-employed ( $M = 8.06, SD = 2.82$ ) individuals, as students tended to have a more positive view on the ‘Behavioral Outcomes” brought by the event than did those who were employed or self-employed. Of note, the factors ‘Tourism Effects” ( $p = 0.085$ ) and ‘Financially Worthwhile” ( $p = 0.093$ ) both showed differences approaching significance.

In terms of group differences on “monthly income”, the factors “Financially Worthwhile” [ $F(2,150) = 3.624, p = 0.029$ ] and “Inconvenience and Stress” [ $F(2,150) = 3.042, p = 0.051$ .] both showed significant differences. A review of the Tukey Post Hoc tests found that differences for the factor “Financially Worthwhile” occurred between middle class ( $M = 7.33, SD = 3.53$ ) and upper class ( $M = 9.12, SD = 3.86$ ) individuals, with middle class individuals having a much more negative view on the “Financially Worthwhile” factor than upper class individuals. A review of the Tukey Post Hoc tests also found that differences for the factor

| Demographics         | Factor 1<br>Tourism effects |          | Factor 2<br>Inconvenience<br>and stress |          | Factor 3<br>Safety and<br>security |          | Factor 4<br>Social impacts |          |
|----------------------|-----------------------------|----------|-----------------------------------------|----------|------------------------------------|----------|----------------------------|----------|
|                      | M                           | Std. Dev | M                                       | Std. Dev | M                                  | Std. Dev | M                          | Std. Dev |
|                      | 29.82                       | 8.12     | 16.19                                   | 5.29     | 8.89                               | 3.94     | 20.26                      | 7.73     |
| Gender               |                             |          |                                         |          |                                    |          |                            |          |
| Male                 | 29.12                       | 8.80     | 15.96                                   | 5.71     | 8.98                               | 3.89     | 20.03                      | 7.98     |
| Female               | 30.43                       | 7.52     | 16.46                                   | 4.89     | 8.83                               | 4.03     | 20.52                      | 7.56     |
| Age                  |                             |          |                                         |          |                                    |          |                            |          |
| 18–39                | 30.49                       | 7.91     | 16.61                                   | 5.03     | 9.11                               | 4.08     | 21.26                      | 8.04     |
| 40–59                | 29.28                       | 8.23     | 15.99                                   | 5.14     | 8.71                               | 3.79     | 19.99                      | 7.43     |
| 60+                  | 30.21                       | 8.34     | 16.02                                   | 6.25     | 9.03                               | 4.25     | 19.28                      | 8.12     |
| Job status           |                             |          |                                         |          |                                    |          |                            |          |
| Student              | 33.35                       | 5.14     | 16.95                                   | 4.13     | 10.57                              | 3.87     | 23.66                      | 7.72     |
| Employed             | 28.07                       | 8.26     | 16.19                                   | 4.70     | 8.73                               | 3.82     | 19.09                      | 7.15     |
| Self-Employed        | 29.12                       | 7.73     | 16.04                                   | 5.60     | 8.04                               | 3.29     | 19.14                      | 7.10     |
| Retired/Unemployed   | 29.48                       | 10.17    | 15.42                                   | 6.11     | 8.81                               | 4.49     | 20.89                      | 7.80     |
| Other                | 31.52                       | 7.84     | 16.33                                   | 6.37     | 8.91                               | 4.35     | 20.67                      | 9.05     |
| Monthly income       |                             |          |                                         |          |                                    |          |                            |          |
| < R\$4,400           | 30.68                       | 7.37     | 16.39                                   | 4.39     | 9.09                               | 4.14     | 21.64                      | 7.17     |
| R\$4,400 – R\$11,000 | 28.03                       | 7.86     | 14.88                                   | 5.59     | 8.47                               | 4.05     | 18.57                      | 8.33     |
| R\$11,000+           | 31.26                       | 8.18     | 17.35                                   | 5.37     | 9.22                               | 3.72     | 20.98                      | 7.46     |

Table 3.  
Demographic  
comparisons for  
factor 1–4

Source(s): Author’s own creation/work

| Demographics                                 | Factor 5<br>Behavioral outcomes |          | Factor 6<br>Financially worthwhile |          | Factor 7<br>Economic impacts |          | Perceptions<br>of Olympic<br>legacies |
|----------------------------------------------|---------------------------------|----------|------------------------------------|----------|------------------------------|----------|---------------------------------------|
|                                              | M                               | Std. Dev | M                                  | Std. Dev | M                            | Std. Dev |                                       |
|                                              | 8.66                            | 3.24     | 8.05                               | 3.79     | 4.97                         | 2.29     |                                       |
| <i>Gender</i>                                |                                 |          |                                    |          |                              |          |                                       |
| Male                                         | 8.59                            | 3.24     | 7.96                               | 3.57     | 4.68                         | 2.06     |                                       |
| Female                                       | 8.70                            | 3.28     | 8.18                               | 4.00     | 5.26                         | 2.45     |                                       |
| <i>Age</i>                                   |                                 |          |                                    |          |                              |          |                                       |
| 18–39                                        | 9.24                            | 3.53     | 7.71                               | 3.83     | 5.27                         | 2.54     |                                       |
| 40–59                                        | 8.61                            | 3.05     | 8.15                               | 3.79     | 4.83                         | 2.25     |                                       |
| 60+                                          | 7.80                            | 3.18     | 8.36                               | 3.83     | 4.88                         | 1.99     |                                       |
| <i>Job status</i>                            |                                 |          |                                    |          |                              |          |                                       |
| Student                                      | 10.78                           | 3.39     | 8.92                               | 4.17     | 5.50                         | 2.44     |                                       |
| Employed                                     | 8.03                            | 2.94     | 7.00                               | 3.17     | 4.94                         | 2.40     |                                       |
| Self-Employed                                | 8.06                            | 2.82     | 7.91                               | 3.76     | 4.53                         | 2.26     |                                       |
| Retired/Unemployed                           | 8.89                            | 3.03     | 8.85                               | 4.40     | 4.75                         | 2.11     |                                       |
| Other                                        | 8.73                            | 3.76     | 9.01                               | 3.88     | 5.29                         | 2.17     |                                       |
| <i>Monthly income</i>                        |                                 |          |                                    |          |                              |          |                                       |
| < R\$4,400                                   | 9.23                            | 3.49     | 7.64                               | 3.72     | 5.09                         | 2.61     |                                       |
| R\$4,400 – R\$11,000                         | 7.90                            | 3.15     | 7.33                               | 3.53     | 4.48                         | 2.24     |                                       |
| R\$11,000+                                   | 8.97                            | 3.01     | 9.13                               | 3.86     | 5.35                         | 1.98     |                                       |
| <b>Source(s):</b> Author's own creation/work |                                 |          |                                    |          |                              |          |                                       |

**Table 4.**  
Demographic  
comparisons for  
factor 5–7

“Inconvenience and Stress” occurred between middle class ( $M = 14.88$ ,  $SD = 5.59$ ) and upper class individuals ( $M = 17.35$ ,  $SD = 5.37$ ), as those in the middle class bracket had a more negative view on the “Inconvenience and Stress” brought by the event than did those in the upper class bracket. Of note, the factors “Tourism Effects” ( $p = 0.088$ ) and “Behavioral Outcomes” ( $p = 0.099$ ) both showed differences approaching significance. When it comes to the group differences of “gender”, the factor “Economic Impact” was approaching significance ( $p = 0.089$ ). Meanwhile, for the demographic variable of “age” there were no statistically significant differences.

#### *Respondent narratives – economic impact*

Some of the quantitative findings discussed above are complemented by the answers participants provided to the open-ended questions. The backwards translation was done by the principal investigator of this study and confirmed by a Brazilian-born professor teaching sport management abroad in the United Kingdom. When answering “How did the 2016 Olympic Games impact you and your family economically?”, 144 participants provided a response. Although most participants answered: “no change”, “nothing”, “indifferent”, “zero”, “very little” or “almost nothing”, around one-third of the answers were in-depth, insightful responses. Most of the negative in-depth responses touched on the “absurd rise in cost of living”, “huge expenses and huge taxes”, as well as “worsened traffic”. In a revealing comment, one participant mentioned that “everything became more expensive, for everybody. They targeted tourists, but the residents were the ones who suffered the consequences” while another respondent highlighted how “rent prices went up and we had to relocate to a different neighborhood”. Those viewpoints are supported by the quantitative findings as “overall cost of living” was rated the worst item of all, as it was seen to have worsened since the Games ended.

In terms of tourism impacts, those who were a part of the industry were very pleased with the opportunities that the Games generated. One participant mentioned that “I worked in a hotel in Copacabana and my salary increased a lot during the Olympics”, while another respondent highlighted how “for myself, it improved because I work in the International Airport” and another participant mentioned that “participating in the construction business created opportunities for personal economic gains”. However, the quantitative findings show that “opportunities for local business” was seen as being “indifferent” while “employment opportunities” was seen to have been “worsened” since the Games ended. A respondent claimed that “since my family’s funds comes from the state government, months prior to the Games the salaries of public workers got delayed, which led to the accumulation of my family’s debts”.

#### *Respondent narratives – social impact*

When answering, “How did the 2016 Olympic Games impact you and your family socially?”, 142 participants provided a response. Around half of the respondents answered either “no change”, “nothing”, “indifferent”, “zero”, “very little”, “almost nothing” and/or “little to no change”. The other half of answers were in-depth, as respondents mostly talked about the positives, with a few noting that the positives were short-term returns that became negative as time passed. Some participants noted that urban mobility seems to have worsened. One respondent highlighted how “The installation of the BRT soon became saturated and led to displacement [...] the subway, which was supposed to go to *Recreio*, only went to *Jardim Oceânico*. Horrible! Dozens of bus lines were cut resulting in urban chaos.” Aside from the BRT, one respondent shared how “many friends lost their jobs once the Olympic Games were over”, while another respondent criticized the post-event use of venues by mentioning that “we have true white-elephants abandoned without any social utility”. Backed by the quantitative findings, “availability of Olympic venues for use by local resident” was perceived by participants as having “slightly worsened” since the Games ended.

In terms of responses that spoke to positive social gains, most of them touched on “opportunities to meet new people”, “increases in leisure areas” and a “unique opportunity to participate/attend/enjoy the event”. Those areas were also seen as having the best impact on participants life since “opportunities to meet new people” was the item with the highest mean. However, participants also complained about how the “good tickets were expensive and sold out fast”. Some participants were happy with the opportunity to learn about other cultures through the national hospitality houses. A few respondents discussed the changes in their perception of social impacts from the time of the event up to now. A notable comment described how “it was super fun during the time of the event, but as good things in Brazil are fleeting, the raw reality returned in a short period of time”.

#### *Respondent narratives – return on investment*

When answering, “How do you feel about the return on investment generated from hosting the Olympic Games? In your opinion, was it worth hosting the 2016 Olympic Games?”, the majority of the participants did not feel it was worth hosting the Games. From their responses, residents are “very disappointed” with the “legacy wasted on unfinished construction and lack of maintenance of equipment” as well as the corruption and overspending partaken by the government. In a noteworthy complaint, one participant mentioned that “In my opinion, it was not worth because the State needs to attend the basic needs of the population before investing in massive stadiums”, while another mentioned that “our country needs to invest in health facilities and education for the people”. Another participant noted that “bike paths have fallen into the sea killing two people”, and that even “the Olympic park, which has a great structure and good quality stadiums, is being left sitting there without investment.”

Some residents argued that they wished the local population had a greater say in the hosting of the Games, as one participant shared that “I wish I had the opportunity to vote. I did not want [the Games]. High investments for little return.” Many residents mentioned how they had high expectations for the legacies the 2016 Olympic Games could bring to them but did not turn out to be beneficial in the long-term. Although residents provided some examples of benefits from having hosted the Games, such as the construction of the Olympic Boulevard, the construction of the light-rail vehicle (i.e. VLT) and of the Museum of Tomorrow, many argued that there was a lack of realistic planning and supervision during the implementation period of the legacies promised prior to the Olympic Games. In a simple statement, a resident concluded that the opportunity to host the 2016 Olympic Games was a “fantastic event but with little positive legacy” left to the population.

## Discussion

The purpose of this study was to analyze Rio de Janeiro residents’ perceptions of legacies left from hosting the 2016 Olympic Games after a full Olympic cycle, while aiming to understand the different perceptions of residents across demographic groups, specifically: (a) age, (b) employment status, (c) gender and (d) monthly income. To summarize the quantitative findings, monthly income was the biggest area of difference for Factor 1 (i.e. Tourism Effects), Factor 2 (i.e. Inconvenience and Stress), Factor 5 (i.e. Behavioral Outcomes) and Factor 6 (i.e. Financially Worthwhile) as individuals in the middle class had statistically significantly more negative views on those factors than individuals in the upper and lower classes. Additionally, on all other factors, even those that did not have statistically significant differences, the middle class had a more negative perception score. Therefore, one could argue that hosting a mega-sport event, such as the Olympic Games, might worsen the perceived legacies of those individuals in the middle-class more so than individuals in the lower or upper class.

This finding differ from [Minnaert \(2012\)](#) and [Rocha \*et al.\* \(2017\)](#) regarding their assumption that the Olympic Games bring fewer benefits and are more detrimental to individuals in the lower class, as our findings show that the middle class felt most negatively impacted. Nevertheless, the findings support the notion that upper-class individuals are clearly more likely to benefit from hosting the Games ([Minnaert, 2012](#); [Rocha \*et al.\*, 2017](#)) as they might be more directly or indirectly involved with the benefits that big developers and hotel/leisure operators typically receive ([Andranovich \*et al.\*, 2001](#)). As the quantitative findings show, “Tourism Effects” was the only factor that was not perceived as have worsened since the realization of the Games. These findings support [Andranovich \*et al.\*’s \(2001\)](#) argument that the Olympic governance model and reliance on public-private partnerships may lead to an unfair distribution of benefits between individuals who work in industries related to the Games to others who do not. Backed by the qualitative findings, participants showed discontent with the legacies left to them post-event. Based on the results, this study supports the notion that managing legacies in a developing country is likely to be more challenging as lack of resources are likely to contribute to a temporal deviation in the priorities of local politicians and event managers post-event, subsequently making “event legacy” lesser of a concern.

In the case of Rio (2016), residents were critical about the burden placed on the local population post-event. To them, the government did not do their due diligence in delivering the promised legacies, and the local population was negatively impacted as they were responsible for bearing the costs of hosting the event without receiving much of the expected benefits promised to them prior to the event. Those findings align with [Rocha’s \(2020\)](#) notion that perceptions of legacies are likely to change over time as more information is available to determine one’s view and perception of legacies tend to become more negative in the years

following the event once promised legacies are not fulfilled as anticipated/expected. Overall, participants showed that they were not satisfied with the legacies left to them and that hosting the Olympic was not worth to most of the population. The key takeaway of this study, however, is that the 2016 Olympic Games seems to have been perceived as detrimental to residents, but particularly more so for the middle class.

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### Conclusion and implications

In conclusion, the findings of this study suggest the Rio 2016 Olympic Games had a more negative impact on middle class individuals than it did to individuals in the lower and upper classes. If the “poor stay poor and the rich stay rich” adage is to be believed, then the middle class is really the group that is likely to gain or lose the most from hosting a mega-sport event. This likelihood assumes that the legacies left to host community will either provide upward mobility to the middle class (e.g. provide better housing, infrastructure, etc.) or will contribute towards a decline for those individuals (e.g. lower purchasing power, gentrification, etc.). Perhaps most noteworthy, regardless of the demographic group, perceptions of legacies brought by hosting the 2016 Olympic Games were either indifferent or negative. It seems that resident perceptions have worsened with time when compared to previous studies available in the literature (e.g. [Rocha, 2020](#); [Ribeiro et al., 2020](#); [Zouain et al., 2019](#)). Therefore, having hosted the 2016 Olympic Games does not seem to have been beneficial to the life of Rio de Janeiro residents in the long term. [Hall and Wise \(2019\)](#) noted that while locals might not participate or follow any particular sport, they “see significant amounts of government funds redirected to build venues for sporting events.” (p. 265). Thus, implications of this research can influence policy makers and legislative regulators by informing them of the negative consequences mega-events can bring to local communities – particularly in developing countries. Theoretical implications can be built upon the findings of this study as mega-event legacies – directly or indirectly – impact residents long after the event is over.

### Limitations and future research

Due to the nonprobability sampling method for data collection utilized in this study, future researchers should consider other forms of probability sampling. The recruitment process utilized in this study was needed due to the coronavirus pandemic. Due to the expected small sample size, open-ended questions were added to the study to enhance the findings of the survey ([Wisdom et al., 2012](#)). Future studies could also examine the impact of the coronavirus pandemic on resident perception of legacies. Additionally, Rio de Janeiro was awarded the Games in 2009 and hosted in 2016, so all participants were 12 years younger when the Games were awarded and around five years younger when the Games were hosted. We recognize that some participants might have been quite young during the award/host years, while others might have changed demographic classes during those periods as well. Future studies should consider analyzing the legacies through a longitudinal approach when data is collected at least one Olympic cycle before and after the period of the Games. Given the apparent unfavorable view of Rio residents about the Rio 2016 Olympic legacy, it might also be worthwhile to hear Rio 2016 OCOG members perceptions of the long-term legacies left from their Games, as they are likely to possess more knowledge about the planning, implementation and delivery of the intended Olympic legacy.

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