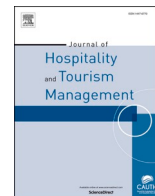




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Resident attitudes toward the Rio 2016 Olympic Games: A longitudinal study on social legacy and support behaviours

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ABSTRACT

The current study describes changes in Rio resident attitudes regarding perceived social legacy and examines its effect on support behaviours from pre-to post-Games stages. Four random samples of local residents from Rio de Janeiro were surveyed in 2015 (n = 532), 2016 (n = 519), 2017 (n = 465), and 2020 (n = 391). A MANOVA and a series of ANOVA tests were performed to analyse the differences in perceptions in different temporal stages followed by a structural equation analysis. Results showed that perceptions of social legacies and support for Rio 2016 has changed over time, increasing during the Games-time, but gradually going down after the event. Findings confirmed the positive and significant effect of the social legacy as a predictor of resident support for the Games in all four stages.

1. Introduction

Sport mega-events have become global occasions of enormous social and cultural importance in recent decades (Müller, 2015). Mega-events such as the Olympic Games or World Cups are international celebrations that for the host cities have a direct impact on community pride (Magno et al., 2020) and social development (Ribeiro et al., 2020) while enhancing urban venues (Pereira, 2018). For instance, in some BRICS countries such as South Africa, the main purpose was to reduce poverty and social inequality when hosting the 2010 World Cup (Pillay & Bass, 2008). In India, the Commonwealth Games aimed to enhance the country's global recognition and status (Sengupta, 2017), and the most recent mega-events in Brazil sought to advance urban development and the transport infrastructure in the host cities (Ribeiro & Almeida, 2020).

The International Olympic Committee (IOC) and different organizing committees of the Olympic Games (OCOGs) have strongly relied on the concept of social legacy to increase support from their local residents (IOC, 2017a). Social legacy is related to the intangible and symbolic nature of residents' perception of experience and their direct or indirect involvement in the mega-event (Chappelet, 2012). Every host city commits to hosting the Olympic Games as part of their social responsibilities for local communities (IOC, 2021) and as a long-term

development process (Rocha, 2020). The current literature puts forward three assumptions underlying the hosting process: first, Olympic Games should be used as a social tool to increase social participation, transparency, and equity (Pereira, 2018). Second, the Olympics should enhance civic pride and encourage community attachment with the event (Magno & Dossena, 2020), improving their quality of life. Third, they should promote social mobility, an important aspect to be considered when designing venues and planning the social legacy of the mega-events (IOC, 2017b). To apply these aspects in Olympic cities is a long-term challenge that needs to be integrated into legacy planning for the benefit of social consequences (MacAloon, 2016).

Despite all the expected legacies, in recent years resident support has also been considered a key ingredient to host successful Games (Rocha, 2020). It is widely recognized in event tourism literature that community involvement, attachment, or tolerance are essential to impact resident attitudes and behaviours toward the event (Qi et al., 2021). At this point, a wide range of factors such as community-related empowerment (Kim & Walker, 2012), the perceived positive and negative impacts of tourism (Olya & Gavilyan, 2017), or satisfaction and quality of life (Kaplanidou et al., 2013) may influence the support behaviours of the locals. In particular the Rio Olympics in Brazil offers appropriate case studies to discuss the pre- and post-Olympic legacies because it

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provided real impacts on their host communities (Ribeiro et al., 2020). Previous studies highlighted the creation of local coalitions focused on urban themes such as gentrification in a pre-Olympic setting (Gaffney, 2016), redistribution of accessibility and socio-spatial inequalities (Pereira, 2018), or the lack of transportation planning in the host city (Ribeiro & Almeida, 2020). These coalitions of civic boosters such as community leaders and politicians (e.g., Popular Committee of Rio Olympics; Gaffney, 2016) use the Olympics as their fight-back focal point (Lauer mann, 2019), influencing the public opinion and their support behaviours for the event.

Despite previous attempts to assess the Games' social value, they have had some important limitations in particular in emerging settings. First, continued and longitudinal analysis in terms of accurately measuring social legacies are lacking (Thomson et al., 2020). While some event legacy researchers have endeavoured to cast more insights on social outcomes (Minnaert, 2012; Ziakas, 2016), it is important to question how long-term changes can be identified, measured, and attributed to the event. Second, little is known about lasting positive or negative relationships and intersections between social outcomes and popular support behaviours around sport mega-events (Prayag et al., 2013). In fact, this relationship may start weak and grow stronger, or the opposite, as the event approaches and after the people live through the benefits or costs from social transformations in the city (Rocha, 2020). Empirical research has yet to prove or refute these assumptions and tracking changes over time. Third, the majority of studies have been focused on developed countries such as the United States, Canada, or the UK (Oja et al., 2018; Ritchie et al., 2020), while few studies have assessed the social legacies in the BRICS countries (Thomson et al., 2018). Hence, general conclusions should be made with caution as many of the studies are not comparable with each other since they are implemented in different social and political environments (Chalip, 2017).

Considering these issues and referring to the Rio 2016 Olympic Games, this study proposes a longitudinal design with the purpose of describing the changes in Rio resident attitudes regarding perceived social legacy and examining its effect on support behaviours from pre-to post-Games stages. In this sense, the following questions were explored:

- How does resident perception of the social legacy vary over the years?
- Does the relationship between social legacy and support behaviours toward hosting the Rio Olympics change over the years?
- What are the lessons learned for future Olympic bidders from the BRICS?

In this paper we support two theoretical perspectives to clarify the social value residents impute to hosting mega-events, present our findings to track changes over time, examine structural relationships, and discuss potential implications of social legacies as an important theoretical contribution to support mega-events in the host communities.

2. Literature review

2.1. Theoretical base

Recent studies investigating resident perceptions towards hosting a sport mega-event draw from prospect theory (PT) and social representations theory (SRT) (Ribeiro et al., 2020; Sato et al., 2020). As described by Kahneman and Tversky (1979), PT is a behavioural economic theory concerned with understanding how people behave based on potential gains and losses. The theory assumes that initial perceptions before the event serve as a mental 'reference point' for any later re-evaluation of those effects (i.e., value function). If there is a disparity between pre- and post-event perceptions, residents modify their perceptions and consequently their attitudes towards supporting a sport mega-event (Scheu & Preuss, 2018). Expectations lower than the reference point are seen as

losses, leading to negative perceptions and disappointment. Outcomes above the reference point are considered gains, resulting in positive and support perceptions (Ribeiro et al., 2020). The PT addresses directly how these perceptions are framed and re-evaluated in the decision-making process towards a mega-event (McDermott, 2001). This re-evaluation helps residents establish a new reference point and decide whether or not to support events.

The SRT has also been used as a useful framework to explain social influence about sport phenomena (Kenyon & Bodet, 2018). As noted by Moscovici (1984), SRT is concerned with the shared knowledge, ideas, thoughts, and opinions held by a group or community and shaped by that particular group's shared beliefs, values, and attitudes. Applied to the Olympics context, when residents analyse the mega-event, then past experiences, knowledge, and values are regarded as a "reference point" (Ribeiro et al., 2020), suggesting that interaction with information sources tend to influence their mental representations of the mega-event (Zhou & Ap, 2009). These information sources are provided by local, regional, and international media and/or social groups that shape the initial perceptions of the mega-event. In addition, social representations have their own cultural meaning and persist independently of individual experience (Moscovici, 1984). Whilst resident perceptions of event legacies or impacts have been highlighted in previous studies (Kaplaniidou et al., 2013), a focus on community support behaviours is increasingly being considered (Schnitzer et al., 2019). Given the apparent importance to enhance the quality of life of the host city residents (Preuss, 2019), examining social behaviours can lead to understanding the support for major events. This will contribute to an evolving body of literature exploring sport and mega-events specifically through the lens of SRT and PT.

These theoretical bases assume that resident judgement throughout the Games contains a more holistic memory-based evaluation of the event in their gains or losses, experiences, and social interactions (Lee et al., 2013). The combination of these theories will allow to add rigor to explain the differences in magnitude from pre-to post-Games, arguing how it might occur and what social effects it can generate. Thus, bridging these frameworks may help clarify the social value that residents impute to hosting the Olympic Games because not all of them attribute the same value to the mega-event (Ritchie et al., 2020) and not all of them support it over time (Rocha, 2020).

2.2. BRICS countries and Rio's initiative

The BRICS countries (i.e., Brazil, Russia, India, China, and South Africa) are becoming increasingly successful in bidding to host international mega-events. Brazil is not the only country to host mega-events such as the FIFA World Cup and the Olympic and Paralympic Games over the last decade (Müller & Gaffney, 2018). In fact, an increased number of BRICS countries have hosted major events such as China (2008 Olympics and 2010 Expo), India (2010 Commonwealth Games), South Africa (2010 World Cup), and Russia (2014 Winter Olympics and 2018 World Cup). These social initiatives can foster and promote South-South cooperation as embodied in its cultural heritage and the hosting of international sporting events (Tella, 2017) with impact on the quality of life of their citizens. This is of particular importance for fast-growing cities (e.g., Surat in India or Shanghai in China) where mega-events may be viewed as catalysts for major social transformations (Powell, 2018). Fig. 1 shows the number of sport mega-events hosted in the last 24 years considering the Müller classification scheme for mega-events (2015). While recognizing that hosting disparity between the developed and developing countries is evident (see Fig. 1), the mega-events have been increasingly attracted by emerging states such as BRICS countries.

Recent literature on mega-events hosted in BRICS has focused their short-term challenges, highlighting the profound positive and negative impacts on host communities (Grix et al., 2017; Ribeiro et al., 2020). Though these events may reach an international audience, strengthen



Fig. 1. Sport mega-events hosted from 2000 to 2024 around the world.

Notes: N/H – Non-hosting; 1 SME – 1 hosted sport mega-event; 2 SMEs – 2 hosted sport mega-events; 3 SMEs or more – 3 or more hosted sport mega-events. Sports mega-events classification scheme based on Muller’ studies (2015), which include: Olympic Summer and Winter Games; FIFA World Cup; UEFA Euro; Asian Games.

national image, and foster urban changes in emerging cities (Müller & Gaffney, 2018), they also have been associated with problems and a downside such as escalating costs, displacement, and gentrification wrought upon the hosting process (Gaffney, 2016). The paradox is that emerging cities increasingly compete to host mega-events despite the weak research evidence on significant economic and social benefits for the host city or region (Lauermann, 2019). The major challenge for the BRICS cities is to address social imperatives such as the lack of access to healthcare services and public transports (Pereira, 2018) and at the same time tackle poverty (Pillay & Bass, 2008) and environmental challenges such as water pollution (Mao & Huang, 2016).

The prevalence of protest movements and the salience of counter hegemonic narratives in the years leading up to such events are sufficiently frequent or extreme phenomenon across the BRICS nations, as happened before the South African, Brazilian, and Russian World Cups (Müller & Gaffney, 2018) and most recently in the Rio Olympics (Ren, 2017). The emergence of anti-bid groups (e.g., “No Boston 2024”; “Rio Exclusion Games”) has highlighted local concerns about the negative legacies such as property value, private gains, and resident displacement through forced removal (Ren, 2017). A similar dynamic was evident in Rio de Janeiro where the local government mismanaged the Olympic legacy without public input, which led the city into a state of emergency before the event (Ribeiro et al., 2021). Although some scholars have highlighted the positive social impacts in such host city (Rocha et al., 2017), the evidence is essentially based on short-term perceptions. In fact, the Rio Olympics took place in a troubled economic moment, plunging the country into multiple crises such as presidential impeachment, corruption scandals, and public panic over the Zika virus (Müller & Gaffney, 2018), which persisted after the Games. Appendix-A summarizes the most important macro and micro social issues surrounding Rio 2016, including temporary coalitions and social controversies.

2.3. Mega-events and social legacy aspiration

Leaving a positive social legacy is one of the recent concerns of the

emerging cities as a way of legitimizing the hosting (Preuss, 2019). However, building such a legacy involves facing an essential contradiction that is still to be discussed, which is how can a city meet its demands and those of its inhabitants while mega-events are increasingly aligned with large social issues (Ribeiro et al., 2021) but with lasting impacts on the host community (Rocha, 2020)? Scholars have developed the concept known as “social legacy” to gauge the enduring, intangible, and deliberate effects of mega-events on a local community (Oja et al., 2018). As noted by Chappelet (2012), social legacy refers to the symbolic nature of the residents’ perception of experience and direct or indirect involvement in the event. By using an event to bring citizens together and promote social interaction (i.e., social capital; Minnaert, 2012), community attachment (i.e., social development; Mao & Huang, 2016), and the pride and recognition of the city (i.e., civic pride; Kim & Walker, 2012), a legacy of social improvements can be promoted by the local community (Karadakis & Kaplanidou, 2012).

In the last decade, there has been an increase in the number of studies concerning mega-events and their intangible legacies on the host cities/regions (Ma & Kaplanidou, 2017). Leopkey and Parent (2012) describe how the social legacy concept evolved and relates to social issues such as progress, health, locals’ impact, new opportunities, and civic engagement. Others have developed approaches to define or typify “social legacy” in a way so as to assess whether it delivers a positive or negative impact on the host city (Clark et al., 2016; Preuss, 2019). In turn, the IOC has also reframed their understanding of legacy to include a greater focus on social impacts, highlighting social development through sport in their Sustainability Report (IOC, 2017a). And recently, the United Nations has also waded into the discussion of mega-event legacy through the social binding of their Sustainable Development Goals and Sport (SDG 3, 4, 5, and 16; UN, 2018).

Recognizing both the increase in theoretical and practical interest and the corresponding challenge in effectively measuring this legacy type, several researchers (e.g., Preuss, 2019; Rocha, 2020) have argued that legacy research requires a long-term approach. Comparative evidence regarding the social effects of the Olympic Games is scarce, and there is an even greater dearth of studies focusing on non-infrastructure

programs (Minnaert, 2012) from the event's preparation until its wrap-up (Clark et al., 2016). Moreover, legacy should be interpreted with reference to the host city's particular context (Chalip, 2017) and cannot be disconnected from the local authorities' accountability. This implies in constant and long-term planning (Ribeiro & Almeida, 2020). Whilst many forms of legacy are discussed within literature, social legacy is often neglected (Legg, 2019). As noted by Thomson et al. (2018), only a small number of articles ($n = 19$) have discussed the importance of intangible legacies (e.g., social legacy) and their effects on the host communities. This is a problematic issue considering legacy planning process has shifted from retrospective to prospective (Legg, 2019). As a result, the importance of understanding social effects as a long-term planning process and assessing their consequences on resident support is highlighted in this study. This represents an important contribution to the event tourism literature.

2.4. Mega-events and resident support

Mega-events have an effect on almost every aspect of hosts' lives, particularly on the sociocultural issues in the host cities legacy (Legg, 2019). For some stakeholders such as local groups, communities, or minorities, the social benefits may be rare, though prominently featured in the promotional narrative used by governments to gain public support (Parent & Chappelet, 2015). Previous studies have examined the antecedents influencing resident support behaviours in the event tourism literature (Olya & Gavilyan, 2017; Prayag et al., 2013; Zhou & Ap, 2009). While these studies have identified a number of factors such as costs and benefits, community attachments, and environmental concerns as critical determinants of resident attitudes (Chi et al., 2018), the intangible legacies may be an important component of support behaviours (Ma & Kaplanidou, 2017), which rarely are considered by existing research.

Theoretically, residents who see value in tourism and believe the costs do not exceed the benefits will have a positive legacy perception and will consequently support the event (Ritchie et al., 2020). Among the benefits are urban development (e.g., new means of public transport), growth in tourism (e.g., jobs and national image) or improvement in resident quality of life (e.g., more social justice, cultural experiences, and sports) (Ma & Kaplanidou, 2017). Rio de Janeiro is an interesting occasion to discuss the planned legacies and the support behaviours particularly given its clear objectives when it bid for the Rio Olympics. The Brazilian government and OCOG intended to promote three sustainable aims based on the planet (e.g., environmental legacy), on prosperity (e.g., economic and tourism view), and in particular on the people (Rocha, 2016). This last pillar encompassed social, cultural, and psychological legacies as a way to enhance quality of life, foster diversity, and social inclusion (Rio 2016; 2013), as well as encourage the young population to participate in sports (e.g., "Transforma Program"; Ribeiro et al., 2020).

Nevertheless, from events hosting to legacy outcome takes so many years that resident attitudes and behaviours are very likely to fluctuate over time (Rocha, 2020). As noted by Parent and Chappelet (2015), the organizing committee typically has between two and seven years to plan the event and the challenge of implementing the legacy plans can take more than ten years. Considering this duration, the possibility of converting impacts into legacy outcomes can be a very realistic goal if planned early (Kaplanidou et al., 2016). Several scholars have advocated for longitudinal studies in order to better understand how resident perception is built in communities hosting mega-events (Ritchie et al., 2020; Waitt, 2003). In addition, most previous research is performed post-event (Thomson et al., 2020), or in limited cases in the lead up to the event taking place (Prayag et al., 2013). To date, no research has yet examined the effect that social legacies have on support for hosting an event considering the magnitude of the 4 stages from pre-to post-Games. This represents another relevant contribution to the related literature and in particular towards studying the BRICS countries.

As noted by PT, residents would support the mega-event development in their cities/regions if the outcomes were above their expectations (Lee et al., 2013; Sato et al., 2020). In particular, residents with a high level of expectations/perceptions about the event are more likely to believe in the positive legacy and thus tend to support the event hosting (Rocha et al., 2017). In addition, involving the hosts in the decision-making of the event enables bottom-up approach in the planning and continuous re-evaluation of their support behaviours (McDermott, 2001). This social prospect supports the hypothesis of a positive relationship between a perceived positive legacy and popular support. Residents tend to support the mega-event if the Olympic legacy outcomes are better than they expected, and thus, if they bring more benefits to the host city and to the residents themselves (Gürsoy et al., 2017). Thus, the model proposed examines the effect of social legacy outcomes on the resident support to the event (Fig. 2), and this led to the following path to be tested:

H1. Positive social legacy perceptions will have a positive effect on resident support for the Games.

3. Method

A case study approach was selected and a longitudinal design was conducted in four waves to explore perceptions of Rio de Janeiro residents regarding the Rio 2016 Olympic Games. In an event tourism context, the social representations paradigm and prospect framework form the foundation for explaining resident attitude changes from pre-to post-Games. The social factors examined refer to community pride (CP), community attachment (CA), community infrastructure (CI), and resident support (RS).

3.1. Data collection and sample

Data were collected among Rio's residents by using an online questionnaire. Cross-sectional samples were obtained in different moments and the sampling strategy employed was twofold: (1) a local university database and (2) local resident-groups on social media networks (Facebook: 15 groups; Instagram: 5 groups). The survey respondents were recruited using the convenience sampling of non-probability sampling. Questionnaires were posted using the social networks (after permission from their content moderators) considering twenty groups of local residents (neighborhood associations or local actors) and a volunteer's database was provided by a Brazilian university. This database contributed to ensure different age and education levels, while the social networks provided the geographical spread across the host city. In addition, the recruiting participants passed three selection criteria: (i) citizens who lived in Rio de Janeiro for at least 7 years; (ii) citizens who attended the Rio Olympics in order to ensure an appropriate view of event hosting; and (iii) citizens who were fluent in Portuguese due to the survey language and the study aims.

Data were collected at 4 different moments: six months before the Games (December 1 to 30, 2015), in Games-time period (August 1 to 26, 2016), a year after the Games (August 1 to 30, 2017), and four years after the Games (August 1 to 30, 2020). All participants voluntarily accepted to participate and agreed to an informed consent form. Data collection occurred during August of each period, except for the first wave, and the same online survey was conducted at every moment. A banner with the questionnaire link and a description of the purpose of the study was activated using a survey administration software (Google Forms) inviting the respondents to participate in the study. At each moment of data collection, the IP address of participants was recorded and further access from these IP addresses was denied after survey submission to avoid repeat participants. Then the data were examined and responses from individuals under the age of 18 or surveys not completely filled in were excluded from further analysis.

The online surveys were identical for all 4 waves (T1, T2, T3 and T4)

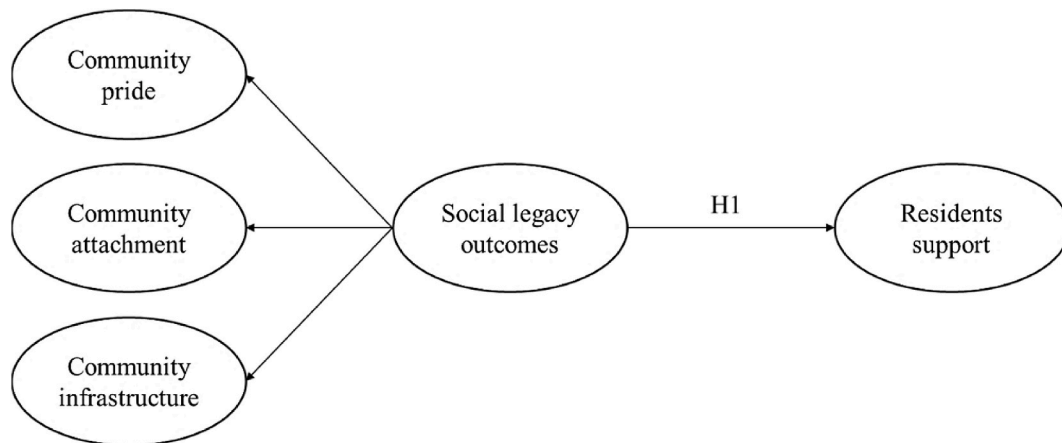


Fig. 2. Hypothesised model. (Color: black and white).

with a total of 532 individuals filling out the questionnaire at T1, 519 responding to the questionnaire at T2 (97.5% response rate compared to T1), 465 filling out the T3 survey (87.4% response rate related to T1) and lastly 391 individuals responding at T4 (73.5% compared to T1).

3.2. Measures

The online questionnaire was constructed assessing a pool of 12 items and containing the following psychosocial measures: community pride (CP), community attachment (CA), community infrastructure (CI), and residents support (RS).

Community pride. The CP captures the residents' positive sense due to increased visibility (nationally and internationally) and enhanced image of their community being an event host city. A 3-item scale related to psychic income was adapted from Kim and Walker (2012) within the mega-event context.

Community attachment. The CA refers to the social interactions and sense of belonging a resident feels towards their community. This construct included a 3-item scale adopted from Kim and Walker (2012) to residents' perceptions of the mega-event.

Community infrastructure. The CI focus on the local residents' enhanced morality in efforts to improve community infrastructure. This factor was assessed using the 3-item scale proposed by Liu (2016) associated with social impact of sports mega-events.

Resident support. The RS was assessed as an individual event impact considering the perceived benefits for the local community. A 3-item scale for measuring resident support was adopted from Rocha (2020) in the Olympics context.

Measures used in the study were originally constructed in English. Three scholars (two Portuguese and a native Brazilian) with experience in sport event management research were invited to rate all 12 items for relevance, representativeness and clarity (DeVellis, 2016). Four items were reworded in response to suggestions from these experts, and the back translation did not revealed differences between the first and the final survey versions. Then, the items were randomly placed in a questionnaire for a pre-test with Rio's residents ($n = 115$) randomly selected from a north zone neighborhood of the city. The final survey version showed no changes and included 12 items measuring psychosocial dimensions and 4 measuring demographic items.

The first section of the survey examined resident perceptions on social legacy and event support, and the second part collected socio-demographic information (e.g., age, gender, education level and residence). A guide question invited the respondents to assess the items according to their level of agreement. The stem for the items read, "Assessing the social legacy of the Rio 2016 Olympic Games, please express your level of agreement with the following statements". In addition, two initial filter questions were included in the questionnaire

related to respondents being (or not) residents of Rio's city and if they attended the Rio Olympics. All items were measured based on positive statements formulated in Portuguese, and they were jumbled within each section. The response format included 5-point Likert-scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The survey items are showed in the Appendix-B.

3.3. Data analysis

Data were assessed over time, in trend designs (pre-to post-Games), considering a random sample at different moments (Ary et al., 2018), without losing representativeness. Firstly, descriptive statistics were calculated for examining the respondents' demographic profile, mean scores and standard deviations of items through AMOS 26.0. Skewness and kurtosis values were also examined to evaluate if the measures were close enough to the regular normal distribution and could be used in further factorial analysis.

Second, a MANOVA (multivariate analysis of variance) was conducted to examine possible differences between social legacy perceptions (CP, CA and CI) and support (RS) in different time periods (T1, T2, T3 and T4). The MANOVA test was employed to test the differences in the vector (centroid) by means of multiple interval dependents for one or more independent categories (Lee et al., 2013). In this analysis, the time-period effect was treated as an independent variable and the 4 dimensions as a set of dependent variables.

In the sequence, a structural equation modelling (SEM) analysis was conducted for each time-period, following the two step-approach (Anderson & Gerbing, 1988). In the first step, the measurement model was tested using confirmatory factor analysis (CFA). In the second step, the structural model, using SEM. The ratio of chi-square (χ^2) to its degrees of freedom and four indices were used to assess the model fit: Tucker-Lewis Index (TLI), comparative-of-fit index (CFI), goodness-of-fit index (GFI), and root mean square error of approximation (RMSEA) (Hair et al., 2009). The constructs' reliability (internal consistency) was indicated by the measures of Cronbach's alpha (α) and by composite reliability (ρ) (Nunnally & Bernstein, 1994). Lastly, average variance extracted (AVE) was used as an indicator of convergent validity and the discriminant validity was assessed by comparing squared correlations among the constructs (Fornell & Larcker, 1981).

4. Results

4.1. Demographic profile of respondents

A total of 1906 participants (532 before, 519 during the Games and 856 after the Games) composed the final sample. Table 1 summarizes the demographic profile of the study sample, which is divided into

Table 1
- Characteristics of samples.

	2015	2016	2017	2020
Sample size	532	519	465	391
Gender				
Male	210	288	249	186
Female	322	231	216	205
Age				
18–29	335	171	251	104
30–39	105	169	127	116
40–49	55	88	49	75
50–59	30	52	28	64
60 or more	7	39	10	22
M(SD)	29.7(11.30)	35.9(13.3)	31.8(11.04)	39.3(11.69)
Education				
High School	237	125	179	125
Higher Education	295	394	286	266
(Bachelor's)	(237)	(302)	(202)	(190)
(Master's)	(37)	(76)	(80)	(45)
(Doctorate)	(21)	(16)	(4)	(31)
Residence				
North	158	176	142	178
Central	101	98	94	19
Midwest	141	142	130	109
South	132	103	99	85

Notes: M - Mean age; SD - Standard deviation.

“2015”, “2016”, “2017” and “2020” waves. Samples were balanced on the gender level, with 974 (51.1%) women and 933 (48.9%) men in the total sample; their ages ranged from 18 to 78 years old, with the average age being 34. Units were shown in different age categories, and the 18–29 (oversampled) and 60 years and over (under-sampled) age groups were consistent across the study. The plurality of respondents in the 18–29 age group may be related to the sampling strategy used and indicates a stronger interest by young people regarding social issues in the Olympic city (e.g., Ribeiro & Almeida, 2020; Waitt, 2003). Specifically, 65.1% of the participants (global sample) reported their highest level of education being college level, with 48.8% reporting having a graduate degree, followed by master degree (12.5%) and doctoral (3.8%). Another part of the sample (34.9%) is skewed towards high school, which is consistent with the population distribution based on the IBGE 2010 census (IBGE, 2010). The final sample also provided a large group of residents who live in different neighborhoods of the city, mainly North zone (34.3%), followed by Midwest zone (27.4%); and South (21.9%) and Central zones (16.2%) of Rio de Janeiro. The characteristics of each sample are described in Table 1.

4.2. Descriptive statistics and MANOVA results

Table 2 shows the descriptive statistics of factors (means, standard deviations, skewness and kurtosis) for the four study samples. Skewness and kurtosis measures indicated no concerns in terms of symmetry and normal distribution of the data. Overall, the mean scores of the expectations and evaluations of social legacy and resident support for the event increased from 2015 to 2016 and decreased progressively from 2016 to 2020. The majority of the items for both pre- and post-Games scale (i.e., 2015; 2017 and 2020) were below the midpoint of the scale, indicating that participant agreement with these items was low (see in Appendix-B). The descriptive statistics revealed that respondents disagreed that the “community attachment” (CA) and “community infrastructure” (CI) have been enhanced before and after the Games. However, the same does not occur in event-time, as the resident’s perception has changed and tends to increase when the event takes place, evidenced higher means on Games-time.

The MANOVA results [Wilks’ lambda = 0.43, F(12,4976.9) = 152.60, p < .001] showed significant changes in resident perceptions over time (see Table 2). The results revealed a positive and significant mean difference for ‘community pride’ [F(3,1884) = 246.1, p = .000],

Table 2
- Descriptive statistics and MANOVA results.

Factors ¹	2015 (n = 532)					2016 (n = 519)					2017 (n = 465)					2020 (n = 391)					MANOVA												
	M	σ	Sk	Ku	p	M	σ	Sk	Ku	p	M	σ	Sk	Ku	p	M	σ	Sk	Ku	p	F	p	Power										
1. Community Pride (CP)	2.59	1.20	.32	-.84	.000*	4.40	.77	-1.81	-4.20	.000*	3.14 ^a	1.24	-.31	-.98	.000*	3.12 ^a	1.17	-.35	-.89	.000*	246.06	.000*	1.00										
2. Community Infrastructure (CI)	2.99	1.13	-.04	-.78	.000*	4.07	.90	-.93	.46	.000*	2.57	1.25	.38	-.83	.000*	2.18	1.02	.51	-.53	.000*	266.64	.000*	1.00										
3. Community Attachment (CA)	3.26	1.16	-.20	-.82	.000*	4.31	.78	-1.31	1.70	.000*	2.76	1.24	.25	-.92	.000*	2.25	1.05	.71	-.10	.000*	315.26	.000*	1.00										
4. Residents Support (RS)	2.56 ^a	1.11	.45	-.50	.000*	4.25	.75	-1.24	1.48	.005	2.54 ^a	1.03	.34	-.43	.000*	2.38	1.09	.43	-.58	.000*	415.55	.000*	1.00										
	2015-2016					2015-2017					2015-2020					2016-2017					2016-2020					2017-2020							
	μ1 - μ2					μ1 - μ3					μ1 - μ4					μ2 - μ3					μ2 - μ4					μ3 - μ4					p		
1. Community Pride (CP)	-1.80					-.53					-.52					.000*					.01					.849**							
2. Community Infrastructure (CI)	-1.08					.42					.81					.000*					.38					.000*							
3. Community Attachment (CA)	-1.05					.50					1.00					1.55					.000*					.50					.000*		
4. Residents Support (RS)	-1.79					-.01					.18					.791**					.171					1.88					.013		

Notes: *p < .001; ** p > .05. ^a Difference is not statistically significant at p < .05. M - Mean; σ - Standard Deviation; Sk - Skewness; Ku - Kurtosis; μ1 - μ2: mean difference.

Factors¹ Cross-sectional sample. MANOVA [F(12,4976.9) = 152.60, p = .000].

‘community infrastructure’ [F(3,1884) = 266.6, p = .000], ‘community attachment’ [F(3,1884) = 315.2, p = .000], as well as on the outcome variable – ‘residents support’ [F(3,1884) = 387.5, p = .000], from pre-to post-Games. In addition, post hoc Tukey tests indicated that all factors differ in all moments, except in CP between 2017 and 2020, and in RS between 2015 and 2017 (p > .05). Table 2 shows the complete results of MANOVA considering the cross-sectional samples.

Considering each social legacy component individually, Fig. 3 shows a non-linear trend (i.e., nonlinear path assuming an increasing change from 2015 to 2016 and then a decreasing trend from 2016 to 2020), very similar across all factors. The results of the social legacies are showed in Fig. 3 and Table 2, and demonstrated that the resident perceptions’ change over time. In particular, the perceptions strongly increased during the Games-time, and follow a decreasing trend gradually after the event. The same occurs for residents’ support, for which perceptions stayed consistently low (below 3) in pre- and post-event, except in 2016. Local residents were not strong supporters of the Games in the year before of the event and maintained their low perceptions one and four years later (2017–2020). In addition, these results also evidenced that locals had higher perceptions of the city image and recognition (nationally and internationally) and lower perceptions of the efforts to improve public infrastructures.

4.3. Results of factor analysis and SEM

The measurement model showed good psychometric properties, in all moments (Anderson & Gerbing, 1988) (see Table 3). All AVE values were above the recommended threshold of 0.50 for convergent validity (Fornell & Larcker, 1981), ranging from 0.61 to 0.67 (2015), from 0.50 to 0.64 (2016), from 0.56 to 0.77 (2017), and from 0.60 to 0.69 (2020). In addition, Cronbach’s alpha and composite reliability values (α and CR) were above 0.70 for all constructs and across the four moments, indicating the constructs were internally consistent (Hair et al., 2009). In all cases, the AVE values were considerably greater than any squared correlations between all pairs of the constructs, indicating the discriminant validity (Fornell & Larcker, 1981). The correlation coefficients ranged from 0.01 to 0.57 between all observed factors. Table 3 shows AVE values, correlation matrix and composite reliability scores for each moment (2015–2020).

The results from the SEM showed that the structural model fit the data closely in all moments (see Table 4). The relationships between social legacy and support intentions were all positive and significant (supporting H1), with 2016 having the highest path coefficients ($\beta = 0.54$; p < .001) and 2017 scoring the lowest ($\beta = 0.31$; p < .01). This result was also supported by the R² values for support intentions in each

time-period (2015 = 0.49, 2016 = 0.54, 2017 = 0.32, 2020 = 0.38) and in overall model’s factor scores (OM = 0.52), which suggest that the proposed model has good in-sample predictive power (Schlägel & Sarstedt, 2016). All path coefficients and accounted variances in each structural model are presented in Table 4.

5. Discussion and managerial implications

In this longitudinal study we investigate resident perceptions in 4 moments considering the CP, CI, and CA focal variables as a part of social legacy of the Rio 2016 Olympic Games and examine the effects on their support for the event. In doing so, this study provides at least three contributions. First, it adds to our understanding of the relationship between social legacy and support behaviours across different time-frames. Second, it shows how social representations associated with the Games-time period (social interaction and communication) may help clarify the social value that residents impute to the event. Third, it lends support to the prospect framework by explaining how residents consider losses from their reference point more negatively than they value gains.

Our empirical findings suggest that the resident evaluations about the social legacy and support for Rio 2016 fluctuated significantly between pre- and post-Games. From 2015 to 2016, resident perceptions increased (MD SL = 1.31; MD RS = 1.74) and then consistently decreased from 2016 to 2020 (MD SL = 1.74; MD RS = 1.87) on a 5-point scale. In contrast to previous studies that found a decrease in Olympic legacy perceptions over the years (Karadakis & Kaplanidou, 2012; Rocha, 2020), in this study the changes in resident attitudes adds to the literature by showing how the evaluation of social legacy increased during the Games (2016) among public opinion. An explanation for this finding might relate to a social effect from short-term perspective due to the emotionally appealing atmosphere that residents felt during the event hosting resulting in a transient nature (Ribeiro et al., 2020). This finding can also be attributed to the social benefits that influenced the local communities and satisfied the residents’ expectations such as civic pride or self-confidence for the event (Kim & Walker, 2012) and to other reasons that may have contributed to enhance resident experiences in the host city such as the complementary events, hospitality houses, or the Olympic boulevard (Ribeiro et al., 2018). In fact, Rio de Janeiro was the first city in South America to host this mega-event, and Brazil reached its highest rank ever on the Medal Table at 13th. At that point also the “showcase effect” of the media coverage during the event (Horne & Manzenreiter, 2006), the information shared by social networks during Games-time (Tang & Cooper, 2017), or the event excitement shaped by particular group attitudes (e. g., exhibition of the medals won on national TV; Ribeiro et al., 2018)

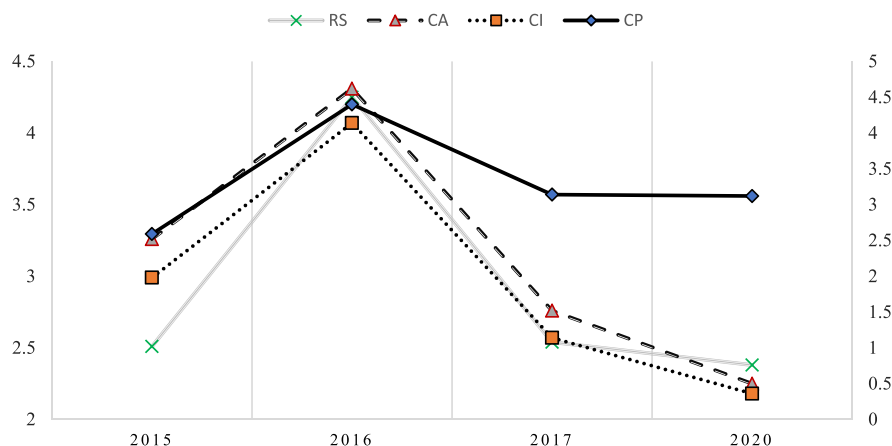


Fig. 3. Variation in residents’ perceptions of social legacies and support for the Rio 2016 Olympic Games. (Color: black and white). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

Table 3

Mean (M), Standard Deviation (SD), Factor Loadings (λ), Composite Reliability (CR), Cronbach's Alpha (α), AVE, and correlation matrix for discriminant validity.

	M(SD)	λ	CR	α	AVE	CP	CI	CA	RS
Pre-Games: 2015 (n = 532)									
Community Pride (CP)	2.59(1.20)	.736–.840	.82	.82	.60	–			
Community Infrastructure (CI)	2.99(1.13)	.801–.837	.86	.85	.67	.57	–		
Community Attachment (CA)	3.26(1.16)	.754–.858	.84	.84	.65	.49	.54	–	
Residents Support (RS)	2.56(1.11)	.691–.851	.82	.81	.61	.39	.34	.35	–
Games-time: 2016 (n = 519)									
Community Pride (CP)	4.40(.77)	.762–.841	.84	.83	.64	–			
Community Infrastructure (CI)	4.07(.90)	.700–.792	.79	.78	.55	.24	–		
Community Attachment (CA)	4.31(.78)	.713–.738	.77	.76	.52	.36	.31	–	
Residents Support (RS)	4.25(.75)	.602–.811	.75	.74	.50	.28	.23	.39	–
Post-Games: 2017 (n = 465)									
Community Pride (CP)	3.14(1.24)	.786–.899	.84	.88	.72	–			
Community Infrastructure (CI)	2.57(1.25)	.851–.916	.90	.89	.77	.10	–		
Community Attachment (CA)	2.76(1.24)	.712–.927	.89	.88	.73	.13	.45	–	
Residents Support (RS)	2.54(1.03)	.615–.887	.79	.77	.56	.01	.03	.02	–
Post-Games: 2020 (n = 391)									
Community Pride (CP)	3.12(1.17)	.755–.823	.83	.82	.62	–			
Community Infrastructure (CI)	2.18(1.02)	.693–.799	.82	.81	.60	.10	–		
Community Attachment (CA)	2.25(1.05)	.765–.876	.87	.85	.69	.11	.55	–	
Residents Support (RS)	2.38(1.09)	.691–.797	.85	.84	.66	.06	.20	.35	–

Notes. No correlations failed the AVE test of discriminant validity; Measurement model.

2015: $\chi^2(48) = 131.55$ ($p < .001$), $\chi^2/df = 2.74$, CFI = 0.97, GFI = 0.95, TLI = 0.96, RMSEA = 0.05.

2016: $\chi^2(48) = 145.19$ ($p < .001$), $\chi^2/df = 3.02$, CFI = 0.95, GFI = 0.95, TLI = 0.94, RMSEA = 0.06.

2017: $\chi^2(48) = 125.33$ ($p < .001$), $\chi^2/df = 2.61$, CFI = 0.97, GFI = 0.95, TLI = 0.96, RMSEA = 0.05.

2020: $\chi^2(48) = 135.42$ ($p < .001$), $\chi^2/df = 2.82$, CFI = 0.96, GFI = 0.94, TLI = 0.95, RMSEA = 0.06.

Table 4

Summary results of the structural model.

Path	Overall model	2015	2016	2017	2020
	β	β	β	β	β
SL \rightarrow CP	.66**	.85**	.73**	.51**	.46**
SL \rightarrow CI	.85**	.87**	.67**	.77**	.77**
SL \rightarrow CA	.89**	.83**	.83**	.86**	.89**
SL \rightarrow RS	.73**	.69**	.74**	.31*	.61**
R ² (SL \rightarrow RS)	.52	.49	.54	.32	.38

Notes. SL – Social Legacy; CP – Community Pride; CI – Community Infrastructure; CA – Community Attachment; RS - Residents Support. * $p < .01$; ** $p < .001$.

may also have aided to shape resident perception, which is aligned with the social representation theory. As a result, the prominence of the host city, the uniqueness of Games-time, the reach of cultural offerings, and the media appeal to hosts and visitors contributed to developing a strong mental connection between the residents and the event.

Longitudinal results of this study also provide evidence that resident perceptions of social legacy and event support from 2016 to 2020 are lower than the reference point, and thus they are seen as losses (i.e., negative perceptions). This indicates that residents do not recognize the social benefits stemming from the mega-event in the long-term and are aware that the social issues in their communities were worsened by staging the Games. Their negative perceptions may be related to widespread evidence of over-budget, corruption, and disbelief in relation to the Olympics legacy (Ribeiro & Almeida, 2021), as well as to their judgments about wider social issues such as security, health, or education (Zimbalist, 2017). In the eyes of the locals, the Olympic promises were far from being delivered, while the city kept suffering from the lack of public facilities and hospitals, the accumulation of dispossession, and the violation of social rights (Pereira, 2018). Despite the high results obtained at the Games-time (above 4 points), the participants reported low mean scores over both pre- (2015) and post-Games (2017–2020) on perceived social legacy and on the support for the event. In addition, a low mean score (equal to or less than 3 points) was also evidenced across all components when compared to the first moment of data collection. This suggests that the Rio residents remained with a low perception of social legacies in the post-Games and formed their reference point using

their initial expectations. This disparity between perceptions over time is consistent with the tenets of the PT (Kahneman & Tversky, 1979) that states that individuals consider the losses to be more than the gains. After the Games, residents adjusted their pre-event perceptions of the legacies (i.e., below their reference point), evidencing that they are less willing to believe in positive legacies and, consequently, to support the event less and less.

The structural equation analysis also revealed that the more the residents perceived the social benefits, the more they expressed intentions to support the event. This is consistent with recent studies noting a positive relationship between legacy outcome evaluation and event support (Rocha et al., 2017) and between resident experience and support behaviours (Schnitzer et al., 2019) or among the community attachment and the support for future events (Bakhsh, Potwarka, Nunkoo, & Sunnassee, 2017). An interesting outcome is that our findings from Rio 2016 showed a contrary trend regarding evidence presented by previous longitudinal studies in BRICS (Kaplanidou et al., 2013; Rocha, 2020) on the structural relationship between perceived Olympic legacy and resident support. This relationship varies over time, increasing as the Games approached (2015–2016), but decreasing as the Games end (2016–2017). This structural relationship is essentially strengthened at the Games-time inasmuch as the hosts engage in new personal leisure opportunities and social interactions within a dynamic process of interaction and communication provided by the event for the host city. Through their involvement, the residents gain personal experience for the intangible outcomes of the mega-event, which allows them to satisfy their social needs and influences their support for the event (Ma & Kaplanidou, 2017). Thus, one may argue that when Olympics are embedded in social benefits for their hosts, the support behaviours by the locals may change and lead them to support the Games.

Notwithstanding that the respondents reported low mean scores for both factors over time (Mlegacy = 2.94 to 2.15; Msupport = 2.56 to 2.38), this structural relationship between the constructs and its explained variance indicates a strong association between pre- and post-Games (2015: R² = 0.69; 2020: R² = 0.61). At that point, our findings might partially corroborate with current studies where residents have associated their support before the Games with intangible legacies (Rocha, 2020) or others reporting that sociocultural legacies are associated with changes on quality of life, which influence the locals'

support for future events (Ma & Kaplanidou, 2017). However, these conclusions should be made with caution as many negative factors such as the lack of political trust and transparency, corruption (Nunkoo et al., 2018), economic crisis, and public health issues (e.g., Zika virus or COVID-19 pandemic; Ribeiro et al., 2020) are outside of the OCOG control and may have an influence on legacy delivery. This is particularly important as it remains an issue for social legacy planning and delivery. Drawing on the empirical results, our study contributes to the literature by showing that intangible legacies can represent an important structure through which residents tend to support the event in their local communities. This fact clearly reinforces the dominant argument for enriching the literature on intangible legacies with longitudinal studies.

5.1. Practical implications

This study also provides interesting practical implications toward helping local governments, OCOGs, and bidding providers to promote the social legacies associated to hosting events, as well as their sustainability and long-term support. First, our results showed that the trend of oscillating popular support for the mega-events can create problems for local governments, particularly when failing to deliver social promises or when they are involved in prominent scandals, distrust, and corruption related to the hosting process (Nunkoo et al., 2018). Unfortunately, such issues are common in other BRICS countries that have hosted previous mega-events (e.g., India: Commonwealth Games; South Africa: FIFA World Cup) leading some researchers to criticize the government role (Ribeiro & Almeida, 2021) and the perpetuation of social inequalities in the host city (Gürsoy et al., 2017). In this respect, it is critical that the governments of BRICS countries strengthen their partnerships with local community subgroups (e.g., positivists, mixed positive, mixed negative, and negativists), listen to their concerns, and engage them so as to develop intentions for positive word-of-mouth. In addition, governments should make available the social policies governing the mega-event, explaining clearly the decision-making processes, and the social long-term implications for their hosts. A social sustainability program is also another way for governments to encourage citizen attachment and promote the participation of socially excluded persons (Minnaert, 2012), which in turn may increase the public trust and change the opinion of local residents (Nunkoo et al., 2018).

Second, OCOGs and local authorities should promote a social dialogue engaging the host communities and create a singular entity to legacy planning and delivery. It is important to note that in our study, resident perceptions of the social legacy received a low mean score on all factors, indicating negative perceptions and disappointment at the pre- and post-Games phase. These issues need to be assessed by OCOGs and must be considered as part of a long-term engagement process (Legg, 2019). This means that a social involvement plan needs to be developed such as focusing on Olympic education, volunteering, and local culture so that the support behaviours and social interest can be built consistently over time. In this respect, it is also recommended that local governments create a separate and independent support entity by signing a Legacy Delivery Contract that plans, leads, and delivers the Olympic legacy on the host communities. This entity should be responsible for ensuring that during the six years of preparations and six years after the event a global legacy program is delivered as per the Games' bidding promised.

Third, the public support level should also be regarded as a fundamental step for the final decision by the IOC to event hosting. In fact, the Olympic bidders promise substantial positive legacies, but often fail to offer a means to deliver on these for the local communities (Legg, 2019). This puts forward the need for more formal methods to legitimize any Olympic bidding through public and participative referendum before the bidding process (Lauermann, 2019). In addition, the IOC plays a

crucial role in assisting OCOGs by bringing in public opinion on the potential positive and negative legacies of event hosting. In this respect, the IOC should encourage developing public discussions and demand a positive consensus of public vote in the bidding process as a way to generate broad civic support. In light of the latest policy changes (i.e., Olympic Agenda 2020 + 5; IOC, 2021), the social legacies and long-term benefits should be considered as a central part of the future bidding processes.

6. Limitations and future research

This study has some limitations and suggestions for future research. The first one is in regard to the sample composition in different waves. The online questionnaire strategy that was used may have limited the sample composition given that there are still some groups of residents from the host region without easy access to the Internet and social networks (i.e., Facebook and Instagram), thus influencing the sample participation and representativeness. In addition, our sample is skewed towards young with a high education level and in the North or Midwest regions of the city. Future studies should collect larger samples that represent participants from different residential areas, possibly considering respondent ZIP codes, and to include the non-host resident perspective (Karadakis & Kaplanidou, 2012). Furthermore, the examination of different stakeholder perceptions in the host city such as activists or socially excluded groups (Minnaert, 2012) may be of paramount importance to better understand the social issues that influence the support behaviours to the Olympic Games.

Second, considering that literature has established that legacies take several years until they are fully built (Horne & Manzenreiter, 2006; Preuss, 2019), our study conducted after six years has its limitations. Even with data being collected four years after the event, some legacies may need more time to be delivered. Thus, future research should consider multiple data collection times (10 years or more) from pre- to post-Games to better assess the social legacies perceived over time.

Third, there are many factors that motivate communities to support sporting events such as improvements to urban venues, tourism, or housing. Although the current study has measured a range of social benefits (CP, CI, and CA) associated with the Olympics legacy, their determinants can have multiple causes. For instance, the personal benefit from tourism or trust in government (Nunkoo et al., 2018) and the satisfaction or quality of life (Kaplanidou et al., 2013) may be acting as legacy multipliers for the wider community. Further research should explore the relevance of other intrinsic and extrinsic factors (Olya & Gavilyan, 2017) to explore the impact of each construct in the model of support for the event. Moreover, the lack of control of other variables might have affected resident perceptions of legacies and intentions of support. Although some demographic characteristics (age, gender, education level, and residence) were collected, other social variables might affect attitudes toward the Games. For example, over-budget, political crisis, and governmental disbelief (Rocha, 2020) should be considered in future studies.

In conclusion, this study explored the changes in Rio residents' perception over time and highlighted how the social legacy may be a significant predictor of their support behaviors. Our findings contribute toward the idea that, in order to achieve resident support for the mega-events, it is not enough to promote the social benefits on short-term at Games-time. What is needed is a well-developed plan on social legacy, which involves the local community together with key stakeholders, and captures both the bidding and hosting of the Games. To what extent the social legacy is more frequent, sustainable or equitable is a matter of debate just as whether such intangible legacy is the most relevant predictor of resident's support. What is clear, however, is that the Olympics' legacy is far more than a tangible sphere for a host city. It involves also intangible elements which influence the residents' support behaviors in a significant way.

Appendix A. Macro and micro social facts surrounding Rio 2016 Olympic Games

Games-period	Date	Fact
Pre-Games	April 2014	Global Justice (Human rights NGO) denounces general public defender of the Rio State to the UN.
	June 2014	Popular Committee of World Cup and Rio Olympics launches the Mega-events and Human Rights Report (3 rd edition) against Olympics.
	April 2015	Political statements remain against the of Rio’s slums evicted.
	June 2015	City Hall evicted local residents without prior notice determined by the Court.
	August 2015	IOC intensifies its presence in the Rio’s city due to constant delays in Olympic infrastructures.
	December 2015	Brazil has an economic retraction of 3.8% (annual variation of gross domestic product - GDP)
	February 2016	AMPAVA headquarters (Fishermen, Friends and Residents Association of the Vila Autódromo) was evicted.
	Mao & Huang, 2016	World Health Organization express concerns and called for the Games postponement (Zika virus).
	April 2016	Deprived communities are evicted from the Vila Autódromo slum.
	April 2016	Break of the bike lane and a citizen dead.
	May 2016	Olympics projects come under criminal investigation.
	June 2016	International Amnesty evidences “social assaults” made from police to locals.
	July 2016	Financial issues, public protests (e.g., policemen) and conflicts in slums open up public security issues in the host city.
	July 2016	Plan to clean 80% of the Guanabara Bay fails.
Games-time	August 2016	Subway closed to the local residents and crowded buses and trains. Queues, weak food and heat affect Rio 2016 fans.
Post-Games	August 2016	Mrs. Dilma Rousseff was impeached and removed from office.
	August 2016	Amnesty International reveal eight dead and repression of peaceful protests in its official report.
	September 2016	Rio 2016 organizing committee dismisses 1900 workers and closes Olympic arenas.
	October 2016	Barack Obama says Rio’s 2016 bidding was ‘manipulated’
	October 2016	Rio 2016 organizing committee breaks its promise and 130.000 people does not receive the ticket refund.
	November 2016	After the Olympics, promised public infrastructures are stopped in Rio’s city.
	February 2017	Olympic Park does not receive adequate maintenance after the Games.
	October 2017	Board members (Carlos Arthur Nuzman and Leonardo Gryner) of the Rio 2016 Organizing Committee are arrested.
December 2017	Rio Organizing Committee has US\$ 884 million in debts.	

Appendix B. Mean scores, standard deviations, skewness and kurtosis values

Items	2015				2016				2017				2020			
	M	SD	Sk	Kr	M	SD	Sk	Kr	M	SD	Sk	Kr	M	SD	Sk	Kr
1. Improved the community image as a major city.	2.55	1.33	.38	-.97	4.32	.91	-1.57	2.62	2.97	1.32	-.04	-.96	2.93	1.22	-.01	-.70
2. Gave the community an international recognition.	2.83	1.39	.13	-1.15	4.45	.83	-1.87	3.99	3.37	1.42	-.39	-1.13	3.37	1.43	-.40	-1.13
3. Enhanced local community pride.	2.46	1.46	.54	-1.07	4.43	.89	-1.88	3.64	3.08	1.39	-.19	-1.15	3.10	1.38	-.20	-1.11
4. Reinforced local community cohesion.	3.00	1.35	-.04	-1.09	4.10	1.05	-1.11	.66	2.95	1.32	.03	-1.00	2.01	1.14	.89	-.03
5. Strengthened friendships in the community.	3.55	1.30	-.52	-.77	4.42	.85	-1.62	2.70	2.61	1.41	.31	-1.14	2.06	1.16	.80	-.19
6. Increased social interactions within the community.	3.24	1.36	-.20	-1.10	4.43	.91	-1.75	2.80	2.72	1.42	.21	-1.17	2.71	1.27	.17	-.90
7. Increased urban renewal in the city.	2.94	1.25	.01	-.88	4.01	1.11	-1.07	.47	2.63	1.36	.24	-1.09	2.25	1.22	.50	-.55
8. Built sport facilities useful to the community.	3.31	1.30	.31	-.91	4.29	.93	-1.39	1.70	2.48	1.38	.43	-1.04	2.31	1.23	.78	-.37
9. Improved public infrastructure in the community.	2.74	1.30	.20	-1.00	3.93	1.17	-.37	2.08	2.61	1.35	.32	-.98	2.01	1.14	.53	-.79
10. I believe in the success of the organisation of Rio 2016.	2.46	1.28	.27	-1.12	4.25	.90	-1.16	1.10	2.44	1.21	.45	-1.01	2.30	1.17	.57	-.41
11. Hosting the Olympic Games brings a positive legacy for the community	2.58	1.24	.32	-.78	4.16	.97	-1.03	.50	2.57	1.37	.28	-.58	2.32	1.32	.64	-.66
12. I supported the Rio bidding to host the Olympic Games.	2.65	1.37	.48	-.76	4.35	.91	-1.52	2.03	2.62	1.35	.30	-.62	2.52	1.24	.35	-.72

Note. M-mean; SD-standard deviations; Sk-skewness; Kr-kurtosis.

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