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Legacy perceptions among host and non-host Olympic Games residents: a longitudinal study of the 2010 Vancouver Olympic Games

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This study examined host and non-host residents' legacy perceptions of the Olympic Games utilizing social exchange theory. The importance and legacy outcome evaluation relative to residents' quality of life six months prior, during, and six months after the 2010 Vancouver Olympic Games were evaluated. Data were collected using a telephone survey from a sample of residents living in Vancouver and Ottawa, Canada. Results revealed environmental legacies as the most important across cities and over time followed by economic and socio-cultural legacies. During the event and six months after the event, residents in both cities and over time evaluated tourism, socio-cultural, and psychological legacies as satisfactory, while expected economic legacies were not satisfactory. Psychological legacies were valued mostly during and post-event. The study's theoretical implications involve the differential weight of legacy outcomes for host and non-host residents and the dynamic processes involved in the evaluation of some legacy categories versus others.

Keywords: mega-event; resident perceptions; importance; performance; legacy; non-host residents

Introduction

The Olympic Games is a mega-event staged by the host city, which experiences the direct impacts of the event. Given the size and the scope of the Olympic Games, the host community is not the only one that experiences these impacts. Peripheral communities are also affected through indirect or spillover effects (Deccio & Baloglu, 2002) and external effects, as these can increase the real value of the event (Gouguet, 2002). These external effects according to Gouguet (2002) can be characterized as 'externalities' – 'that is effects that are not mediated directly through market mechanisms but nonetheless have significant economic impacts' (p. 153). External effects can be positive or negative, for example, the enhancement or impairment of social unity; the development of a positive or negative image of the host city; and the creation of infrastructure that can either improve or reduce residents' quality of life (Gouguet, 2002). Examination of residents and non-residents perceptions of mega-event impacts on a host country over time can be beneficial because they can reveal the magnitude of a mega-event hosting policies, programs, and interventions at a national

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level. Resident perceptions related to the importance of legacies and their expected outcomes for their quality of life can change over time (Guala & Turco, 2009). Event organizing committees and local governments should aim to understand these perceptions because the residents encounter the legacies and contribute to the success of hosting the Olympic Games (Guala & Turco, 2009). By gaining an understanding of the importance and legacy outcome evaluation for residents' quality of life, researchers and organizers can be in a better position to accomplish two things: (1) to leverage the positive and minimize negative legacies and (2) to alleviate concerns for the use of infrastructures and facilities built for the Games. Such concerns include the facilities becoming 'white elephants' such as those experienced at the Albertville (1992), Lillehammer (1994), Nagano (1998), Salt Lake (2002), and Winter Olympic Games (Glynn, 2008).

Given that the success of an event requires the support of the residents (Gursoy & Kendall, 2006), their input and perceptions are critical. Without their support, the event hosting process can present challenges such as anger and civil unrest. This tension undoubtedly will be experienced by the visitors and cause them to have a negative experience, damaging the cities' reputation and chances of repeat tourism (Gursoy & Kendall, 2006). Resident support is important for many reasons including: (1) the potential for residents to be asked to vote on tax increases that will help pay for infrastructure and facilities (Preuss & Solberg, 2006); (2) the support they can provide to the event atmosphere by being friendly and hospitable to tourists; (3) the exposure residents will have regarding the positive impacts in the local community over longer periods of time (Gursoy & Kendall, 2006); and (4) securing residents as volunteers who serve as an important resource for the successful hosting of the Olympic Games (Cuskelly, Hoye, & Auld, 2006). Hosting the Olympic Games can lead a city to engage in significant public expenditure necessary for the building of facilities and infrastructure, and provide urban rejuvenation and revival projects, which can leave favorable or unfavorable legacies for residents (Horne, 2007; Preuss, 2007).

Given the national profile of a mega-event such as the Olympic Games, the concurrent examination of legacy outcomes among host and non-host city residents is important but it is lacking in the sport and tourism literature (Deccio & Baloglu, 2002), especially as they relate to the residents' quality of life. As such, residents' perceptions of the legacies associated with hosting a mega-event before, during, and after hosting the event, and reports of any perceptual changes that occur between these three time periods are not readily available for evaluation (Kim, Gursoy, & Lee, 2006). The purpose of this study, therefore, was to examine the levels of importance of legacy programs for residents' quality of life and the evaluation of the outcomes of such legacy programs for host and non-host residents of the Olympic Games pre, during, and post the 2010 Vancouver Olympic Games. Such examination is based on longitudinal data and can inform event management practices about planning and delivering legacy management programs. The three research questions that guided this study are: (1) which legacies are important for Canadian host residents' and non-host residents' quality of life and do they perform up to expectations; (2) are there differences between host and non-host residents' perceptions regarding the importance and legacy outcome evaluation?; and (3) do perceptions of importance and legacy outcome evaluation change over time?

Literature review

Legacies

The concept of legacy is fairly new in the Olympic context and first appeared in the 1990s during the planning of the 1996 Atlanta Olympic Games (Chappelet, 2008). Organizers of the Atlanta Games charged themselves with the task of leaving behind a legacy (Chappelet, 2008). However, following a closer examination of the literature, it was identified that there is no clear definition of what legacy means in a sport event context (Preuss, 2007). Event legacy as used by the International Olympic Committee (IOC) refers to the importance of sport facilities and any community development programs turned over to the public or local sports organizations after the Olympic Games have concluded (Gratton & Preuss, 2008). The problem, according to Cashman (2005), was that when it came to defining legacy, organizing committees would imply that the term was purely positive and there were no negative aspects. This leads to a definition of legacy by Preuss (2007, p. 211) as 'planned and unplanned, positive and negative, tangible and intangible structures created for and by a sport event that remain longer than the event itself.' Legacies have been classified and/or categorized as: sporting, economic, infrastructure, social, information and education, public life, urban, political, and cultural, and as symbols, memory, and history (Cashman, 2005; Chappelet, 2008; Toohey, 2008). Examples of positive legacies in the literature range from easily recognizable legacies, such as business network expansions and sport infrastructure, to difficult recognizable legacies, such as urban regeneration, improved global reputation, emotional capital, and diffusion of knowledge and governance reform. Examples of negative legacies are construction debt, opportunity costs, unnecessary infrastructure, short-term crowding-out, a rise in property rent, and unfair displacement and re-distributions (Cashman, 2005; Gratton & Preuss, 2008; Kaplanidou & Karadakis, 2010; Mangan, 2008; Preuss, 2007; Solberg & Preuss, 2007). Hosting the Olympic Games requires specific 'soft' and 'hard' structures that remain long after the event. Preuss (2007) identified six different event structures that remain after the event: infrastructure, know-how, networks and culture (created while the host city is preparing to host the event), emotions, and image (which are dependent on the success of the event).

These structures have the potential to change the quality of the host city and can leave a positive and/or negative legacy (Gratton & Preuss, 2008; Preuss, 2007). For example, the tourism industry for the host city may experience the following changes: new/improved tourist attractions, renovated or new hotels, improved public transportation systems, an improved image, increased tourism knowledge, and an improved cultural identity (Solberg & Preuss, 2007). With these tourism legacies in place there is a valuable promotional opportunity from the increased media attention that the city receives throughout the Olympiad. This means that the city can show off its tourist attractions along with new and improved infrastructure projects that took place due to the Olympic Games hosting (Chalip, 2002; Owen, 2005; Whitson & Horne, 2006). The media attention also leads to increased awareness of the region, which can attract domestic and international tourists and potential investors (Gursoy & Kendall, 2006; Preuss & Alfs, 2011; Solberg & Preuss, 2007), but which can decay with time (Ritchie & Smith, 1991).

In order to measure the impact of a legacy program, a study must focus on the changes that occur from the mega-event hosting over time. Research by Preuss (2007)

suggested that the Olympic Games are complex and multifaceted events that have ramifications well beyond economic impacts. As such, it is important to consider intangible legacies such as sporting, recreational, political, psychological, and promotional (Preuss, 2007). Preuss (2007) suggested that legacies should be evaluated through the use of a cost-benefit analysis, as this method considers both tangible and intangible benefits and costs to a community in a given period of time.

As discussed by Preuss (2007), most legacy studies focus on one or two legacy outcomes. So far, the most commonly discussed legacy is the sport facilities developed for the Olympic Games, despite the multi-faceted structure of legacies (Chalip, 2002). There have been some studies focusing on the social legacies, such as community pride, cohesion, involvement, interaction, and improved image and awareness (Bull & Lovell, 2007; Solberg & Preuss, 2007). Other legacies relate to the improvement of residents' identity, the development of cultural understanding and self-esteem, the improvement of quality of life, and the promotion of environmental issues (Bull & Lovell, 2007; Cegielski & Mules, 2002; Gursoy & Kendall, 2006). Gursoy and Kendall (2006) found that community pride and international recognition were just as important as the economic impacts of the Olympic Games.

Resident studies discussing the impacts of hosting the Olympic Games usually focus on the tourism and economic impacts, yet these studies neglect to measure how the Olympic Games are related to the cities' long-term goals (Hiller, 2006). This is important because it is imperative to strategically plan for legacies with the long-term development of the host community in mind, or else justifying large investments of public funds may be difficult (Bohlmann, 2006). For instance, in 1977, the city of Los Angeles, California, surveyed the local population to determine their support for bidding to host the 1984 Olympic Games. The survey found that residents were supportive but worried about how the Olympic Games would be financed (Guala & Turco, 2009). Furthermore, in a longitudinal study of the Lillehammer Winter Games, Spilling (1996) found that residents surveyed in 1991 had unfavorable responses; however, when surveyed again in 1994, negative responses related to prior fears had reduced. Another study of Atlanta residents, conducted between 1992 and 1996, revealed that prior to the event, residents were concerned with traffic, inflation, and excessive costs, but post-event, attitudes were more positive (Mihalik, 2000). It is clear that there are intangible costs and benefits for host cities. Before the Olympic Games start, there are high expectations by the local community regarding the economic, social and cultural benefits they will receive, even though they are aware there will be some costs associated with the task (Gursoy & Kendall, 2006). However, it is only after the Olympic Games occur that the citizens realize that primarily the economic benefits are lower than expected (Gursoy & Kendall, 2006).

Given the rationale that mega-events such as the Olympic Games are a national cause, Deccio and Baloglu (2002) suggest that peripheral communities are also affected by hosting an event such as the Olympic Games. However, the understanding of non-host perceptions of any spillover effects associated with hosting the Olympic Games is somewhat superficial (Deccio & Baloglu, 2002). In their study of spillover impacts experienced by a peripheral community of the 2002 Winter Olympic Games in Salt Lake City, Utah, Deccio and Baloglu found that residents did not perceive any significant spillover impacts when it came to opportunities and concerns from the Olympic Games. Furthermore, specifically those residents who were concerned about the environmental impacts indicated that they felt the impacts

would not spillover into South Utah. Residents did indicate that they expected to experience economic and recreational benefits and those who were dependent on the increase in tourism for economic gain indicated they supported the hosting of the Olympic Games and future mega-events (Deccio & Baloglu, 2002). Cegielski and Mules' (2002) study of residents perception at the V8 Supercar Race in Australia found residents living further away from the event had more positive perceptions of impacts than those who lived closer to the event. Specifically, residents living the furthest away had more positive perceptions in terms of tourism benefits and a greater sense of pride and self-esteem.

Resident studies and theoretical framework

In order to gain an understanding of residents' attitudes in supporting tourism, social exchange theory has been used as an appropriate theoretical base (Ap, 1992; Perdue, Long, & Allen, 1990). Social exchange theory states that residents are more inclined to engage in exchange with others if they believe they will receive benefits without acquiring intolerable expenses (Gursoy & Kendall, 2006). The advantages of using social exchange theory are in its potential to explain positive and negative attitudes and investigate exchanges at the individual or communal level (Ap, 1992). Resident attitudes are used to predict behavior in host resident-tourist exchanges. It is implied that residents take part in sport tourism exchanges such as sharing community resources with visitors, and making use of sport tourism resources developed as a result of the event (Fredline, 2005). Residents then evaluate 'the costs and benefits of these exchanges and their overall perception will be the results of an internal cost benefit analysis' (Fredline, 2005, p. 271). If residents feel that benefits experienced from hosting an event outweigh the costs, then they will exhibit supportive behavior and have a positive attitude toward hosting future events (Fredline, 2005). If, however, the residents feel the experience is negative, then an unfavorable attitude will form resulting in a lack of support.

There have been numerous studies utilizing the social exchange theory within the sport event hosting context (Bull & Lovell, 2007; Ntloko & Swart, 2008; Pappas, 2008; Preuss & Solberg, 2006). The collective purpose of these studies was to determine residents' perceptions of the positive and negative impacts of hosting an event. The social exchange theory proposes that favorable resident involvement will occur as long as they feel benefits outweigh the costs of hosting the event (Gursoy & Rutherford, 2004; Harrill, 2004). Furthermore, the tourism literature indicates that the economic, tourism/commercial, physical/environment, and social/cultural impacts are expected to influence residents' opinion of hosting an event, their motivation to be involved in an exchange, and to support the hosting of the event (Yoon, Gursoy, & Chen, 2001).

The use of social exchange theory in the context of the Olympic Games suggests that resident attitudes towards the performance or the expected performance of legacies can be explained by the exchange of benefits (i.e., quality of life) residents will receive from hosting the event (Waitt, 2003). It is important to note that the theory is not stagnant; over time, residents reassess the exchange operation (Waitt, 2003). This reevaluation involves not only an assessment of immediate perceived benefits and costs, but also of longer-term benefits and costs. There is a lot of excitement produced by the national media, governmental agencies, and the organizing committee that influence residents into believing that expected positive

outcomes of the legacies from hosting a mega-event may exceed the expected cost of these legacies (Kim et al., 2006). Before the event, the information supplied by the media and governmental agencies may influence 'residents' own knowledge, values, and past experiences with similar events to shape the initial perceptions on the event, which are ultimately served as a 'reference point' for new encounters' (Kim et al., 2006, p. 87).

Based on this theory, residents' attitudes toward legacies' perceived importance and outcome evaluations for their quality of life may change from the pre-, during, and post-event time periods. As mentioned earlier, pre-event expectations will be the 'reference point' for the during and post-event evaluative comparisons, a notion that is also supported by the Confirmation-Disconfirmation paradigm (Oliver, 1980). Specifically, Oliver's Confirmation-Disconfirmation paradigm suggests that 'outcomes poorer than expected (a negative disconfirmation) are rated below this reference point, whereas those better than expected (a positive disconfirmation) are evaluated above this base' (Oliver, 1980, pp. 460–461). Therefore, in the current study, outcome evaluation perceptions and expectations below the reference point for the during and post-event time periods will result in a negative evaluation, while those listed above will be seen as gains (Kim et al., 2006; Oliver, 1980). It is also important to note that evaluations created at the 'during' point can become new reference points for which residents will evaluate exchanges at the post-event time point (Kim et al., 2006).

Review of the literature shows that there are few studies that have considered the impact of mega-events on quality of life; rather they have focused on resident attitudes and perceptions towards expected impacts. The difference between quality of life and attitude/impact studies is essentially one of measurement as noted in the words of Andereck, Valentine, Vogt, and Knopf (2007):

> attitude/impact studies largely focus on the way in which tourism is perceived to effect the communities and the environment, whereas quality of life studies are typically concerned with the way these impacts affect individual or family life satisfaction, including satisfaction with community, neighborhoods and personal satisfaction. (p. 485)

Review of the literature shows that attitude/impact studies, tend to ask respondents to indicate their level of agreement or disagreement with statements dealing with impacts on their community 'without specific questions linking these impacts with influences on individuals' quality of life' (Andereck et al., 2007, p. 485).

In summary, this study aims to explore the importance of legacy outcomes for residents' quality of life and the feasibility of dynamic change in legacy program and outcome evaluation between host city and non-host city residents. Longitudinal data will allow the examination of the dynamic component of this research. This exploration will shed light into the shifting of legacy importance perceptions and their evaluation overtime. It will also offer a more holistic understanding of the importance of legacies on a local and national level by examining two different samples of residents in two different parts of the country. Such holistic examination is necessary given the national nature of a mega-event such as the Olympic Games. The following section describes the method and data analysis that aim to answer the research questions of this study.

Method and data analysis

To explore the research questions of the study, the 2010 Vancouver Olympic Games were selected as the mega-sport event. Data were collected from a sample of residents living in the city of Vancouver located in the province of British Columbia (BC) and the city of Ottawa located in the province of Ontario (ON). Data were collected using a telephone survey. The sample generation process utilized a phone list from the most current telephone book (selecting randomly one number from each page) from Vancouver, BC, and Ottawa, ON. The researcher randomly selected 1330 telephone numbers from Vancouver and 300 from Ottawa. The difference in size of the two sample groups was a result of time constraints and difficulty in getting individuals to agree to participate. A total of 762 individuals answered the phone between the beginning of July 2009 and mid-October 2009 and were asked to participate in the study. A total of 102 respondents agreed to participate, 48 from Vancouver and 54 from Ottawa, yielding a 13.3% response rate. The second phase of data collection consisted of contacting those who agreed to participate in the first phase, during the Olympic Games in February 2010. From those who agreed to participate during the first phase of data collection, 42 respondents from Vancouver and 48 respondents from Ottawa continued with the second phase of the study. The third phase of data collection occurred six months after the Olympic Games and participants were contacted from August 2010 until the end of September 2010. From those who agreed to participate during the second phase, 41 respondents from Vancouver and 43 respondents from Ottawa agreed to continue. Therefore, due to attrition among the phases the final sample across the three phases for Vancouver was $N = 41$, and for Ottawa, $N = 43$.

The telephone survey consisted of questions related to the rating of importance of legacy programs and outcomes and their evaluation as they relate to the residents' quality of life and demographic-specific items. Specifically, respondents were asked how important each item was to them as it relates to hosting the Olympic Games for their overall quality of life. A follow up question asked respondents about their expectations regarding the evaluation of outcomes of legacies. For the pre-event and during the event stage, the question was worded as 'how do you expect the following characteristics to perform as they relate to the hosting of the Olympic Games to improve your quality of life?' For the post-event data collection phase, the evaluation question was worded as 'did the following characteristics perform to your expectations as they relate to the hosting of the Olympic Games to improve your quality of life?' There were a total of 27 legacy characteristics used for the two areas (importance/expectation evaluation), based on the research of Preuss and Solberg (2006) and the quality of life research by Andereck and Vogt (2000), that were measured on a 5-point Likert scale. The importance questions were anchored from 1 = not important to 5 = extremely important. The outcome evaluation perception questions were anchored from 1 = does not meet my expectations at all to 5 = exceeded expectations. Based on the literature, the importance and outcome evaluation of legacy characteristics were classified a priori under six categories (Economic, Tourism, Environmental, Socio-cultural, Psychological, and Knowledge development). Appendix 1 provides the legacy characteristics that respondents were asked to rate in terms of importance and outcome evaluation for their quality of life. Coefficient alpha was estimated as a measure of reliability for each of the six

categories and is presented in the results section. A new variable was calculated for each category for the importance and legacy outcome evaluations at the pre-, during, and post-event time points by estimating the overall mean score of the items comprising each factor. The new variable was created for each legacy category by multiplying the overall mean score for the importance and the overall mean score for the performance legacy category items. The variable accounted for variability in the importance and evaluation measures and allowed for overtime comparisons on a common set of items. Importance and outcome evaluations were chosen because social exchange theory posits that for an individual to evaluate the outcome of an interaction the item being evaluated must have some importance to both parties involved in the interaction (Andriotis & Vaughan, 2003; Sutton, 1967). The score for these items ranged from 1 to 25 as they were derived from both importance and evaluation scores. Questions on demographics and level of interest in the Olympic Games were also asked. More specifically, respondents were asked to indicate whether they agreed or disagreed on a 5-point scale (1 = totally disagree, 3 = neither, 5 = totally agree) with the statement 'Olympic Games interests me a lot as a sport event.' SPSS 17.0 was used to analyze responses through the estimation of descriptive statistics, one sample *t*-tests, independent sample *t*-tests, and paired sample *t*-tests.

Results

Demographics

Vancouver respondents were represented by mostly females (56.2%), while 61.1% of Ottawa respondents were male. The mean age for Vancouver residents was 39.6 years and 30.4 years for Ottawa residents. The majority of respondents had received at least a College degree. Thirty-three percent of the Vancouver and 24.1% of the Ottawa households had an income of $80,000 or more. Interest in the Olympic Games as a sport event was high for both residents with a mean score of 3.83 for Vancouver and 4.53 (both measured on a 5-point scale) for Ottawa residents. Table 1 presents the demographics from the post-event phase in more detail.

To test the representativeness of the sample, census data for the two cities were acquired and presented below. According to the 2006 Census released by Statistics Canada (2006), the median age of Vancouver's population is 38.6 with an average income of $47,299 and gender being split 49.5% (male) to 50.5% (females). The Census also showed that education levels were: 24% University Bachelor's Degree or higher, 6% below bachelor level, 12% Apprenticeship or Trades certificate/diploma. The Census indicated that for the Ottawa residents, the mean age was 38.4, income was $84,554, with gender consisting of 48.4% males and 51.6% females. The Census also showed that education levels attained were: 32.4% University Certificate, Diploma or Degree; 0.04% Below University Certificate, Diploma or Degree; 0.06% Apprenticeship or Trades Certificate/Diploma. Given the small sample size of the study, the authors wanted to test how closely the sample approximates the population. For this reason, confidence intervals of the true population estimate were calculated for both interval and nominal variables. A one sample *t*-test was estimated for the age variable while for gender, a confidence interval of a population proportion was estimated according to procedures outlined by Ritchey (2008). For

Table 1. Respondents demographics.

	Vancouver ($N = 41$)	Ottawa ($N = 43$)	2006 census Vancouver	2006 census Ottawa
Gender				
Male	43.8%	61.1%	49.5%	48.4%
Female	56.2%	38.9%	50.5%	51.6%
Age				
Range	18–88	21–62	38.6	38.4
Mean	39.6	30.4		
Education				
College degree	43.8%	50%		
Advanced degree	29.2%	33.3%	24%	32.4%
Technical college	10.4%	1.9%	12%	0.06%
Income				
$80,000 or more	33%	24.1%	Average	Average
$60,000–$79,999	20.8%	22.2%	income	income
$20,000–$39,999	18.8%	20.4%	$47,299	$84,554
Sports interest[b]	4.19[a]	4.53[a]		

[a]The scale anchors were: 1 = totally disagree to 5 = totally agree.
[b]The mean scores from this variable are from the post-event stage of the data collection process.

these variables, the tests revealed that the mean scores and proportions available from the study's sample approximate the population profile.

Resident importancelperformance scores pre-, during, and post-event

Given the objective to compare host and non-host city residents over time on multiple legacy categories, item reduction techniques were used. As briefly mentioned in the Method and data analysis section, the items were classified a priori based on the literature under six legacy categories (Economic, Tourism, Environmental, Socio-cultural, Psychological, and Knowledge development) for the Vancouver and Ottawa residents. For these categories reliability coefficients were calculated. Evidence of internal consistency and reliability is provided by Cronbach's alpha (Nunnally, (1978), recommended level of 0.70). Cronbach's alpha values met this cutoff value for the majority of the categories, as can be seen in Table 2, with the exception of the Psychological category which did not meet the alpha value cutoff for the performance characteristics ($\alpha = 0.68$). The researchers kept the Psychological category because it is conceptually consistent and due to the exploratory nature for the study, which deems this alpha value acceptable (Nunnally, 1978).

Once the Cronbach's alpha coefficients were examined and deemed acceptable, an overall mean score was calculated for each legacy category (Economic, Tourism, Environmental, Socio-cultural, Psychological, and Knowledge development) for the importance and outcome evaluations. Once these mean scores were calculated, a new variable (importance $\times$ outcome evaluations) was calculated in

Table 2. Coefficient alpha for all participants surveyed.

Legacies	Importance	Outcome evaluation
Economic	0.831	0.831
Tourism	0.897	0.886
Environment	0.921	0.905
Socio-cultural	0.819	0.874
Psychological	0.708	0.682
Knowledge development	0.774	0.819

order to determine the combined importance and outcome evaluations for host and non-host residents. In order to explore the first research question, one sample *t*-tests were conducted with a critical value set at 3 (mid-point on the 5-point likert scale) in order to examine what legacy aspects are important and whether they perform up to expectations for the host and non-host residents' quality of life over the three time periods (pre-, during, and post-event). The one sample *t*-tests showed that both Vancouver and Ottawa residents were significantly higher ($p < 0.05$) above the neutral point for economic, environmental, and socio-cultural legacies suggesting their importance for their quality of life. Environmental legacies ranked the highest in terms of importance for the residents of both cities. Ottawa residents' scores for psychological legacies were significantly higher than the scale mid-point, indicating the importance of psychological legacies for non-host residents' quality of life. Table 3 shows in more detail the legacy categories mean scores that respondents felt were important for their quality of life.

For the evaluation of legacy outcomes, for both Vancouver and Ottawa residents' economic legacies were significantly lower than the evaluation scale mid-point. It was also found at the pre-event phase that environmental legacies did not perform to expectations for both host and non-host residents given their overall importance for the residents' quality of life. For Vancouver residents, the socio-cultural and knowledge development legacies did perform up to expectations pre-event. For during and post-Olympic Games, residents of both cities evaluated that tourism, socio-cultural and psychological legacies met resident expectations. Table 4 presents the mean scores and significance values of the one sample *t*-test in more detail as it relates to evaluation of legacy outcomes.

In order to explore the second research question, an independent sample *t*-test was conducted in order to determine whether there were any significant differences between the host and non-host residents related to importance and evaluation outcomes of legacies for their quality of life. The only significant difference between the two groups was found for the evaluation of legacy outcomes for the economic legacies at the pre- ($t = -2.12$, $p < 0.05$), during ($t = -2.07$, $p < 0.05$), and post-event ($t = -2.47$, $p < 0.05$) time phase with Ottawa residents providing higher mean scores at all three phases than Vancouver residents. Table 5 provides the results of the independent sample *t*-test in more detail.

Given the exploratory nature of the study, the authors decided to test for differences between males and females on the legacies within both cities and for each

Table 3. One sample *t*-test of host and non-host resident importance of legacy mean scores.

	Vancouver pre-event ($N = 41$)			Vancouver during event ($N = 41$)			Vancouver post-event ($N = 41$)		
Legacies	Mean	SD	Significance	Mean	SD	Significance	Mean	SD	Significance
Economic	3.49	1.12	0.00*	3.48	0.71	0.00*	3.47	0.74	0.00*
Tourism	3.32	1.05	0.06	3.15	0.78	0.22	3.12	0.78	0.30
Environment	3.66	1.09	0.00*	3.65	0.72	0.00*	3.60	0.77	0.00*
Socio-cultural	3.43	1.13	0.01*	3.36	0.86	0.01*	3.37	0.84	0.00*
Psychological	3.35	1.27	0.08	3.24	1.01	0.13	3.23	1.00	0.14
Knowledge development	2.97	1.19	0.89	2.73	1.02	0.11	2.69	0.97	0.06
	Ottawa pre-event ($N = 43$)			Ottawa during event ($N = 43$)			Ottawa post-event ($N = 43$)		
	Mean	SD	Significance	Mean	SD	Significance	Mean	SD	Significance
Economic	3.38	0.91	0.00*	3.51	0.91	0.00*	3.60	0.96	0.00*
Tourism	3.05	1.07	0.75	3.17	1.08	0.29	3.14	1.07	0.38
Environment	3.56	0.97	0.00*	3.69	0.88	0.00*	3.67	0.94	0.00*
Socio-cultural	3.52	0.99	0.00*	3.58	0.85	0.00*	3.55	0.92	0.00*
Psychological	3.34	1.08	0.04*	3.51	0.97	0.00*	3.58	1.04	0.00*
Knowledge development	3.02	0.86	0.86	3.13	0.90	0.34	3.10	0.96	0.46

*Significance $p < 0.05$, target value = 3, mid-point of the scale, 1 = not at all important to 5 = extremely important.

Table 4. One sample *t*-test of host and non-host resident evaluation of legacy outcome mean scores.

	Vancouver pre-event ($N=41$)			Vancouver during event ($N=41$)			Vancouver post-event ($N=41$)		
Legacies	Mean	SD	Significance	Mean	SD	Significance	Mean	SD	Significance
Economic	2.40	0.76	0.00**	2.33	0.76	0.00**	2.34	0.74	0.00**
Tourism	3.06	0.85	0.61	3.39	0.74	0.00*	3.41	0.74	0.00*
Environment	2.66	0.76	0.00**	2.85	0.75	0.21	2.88	0.73	0.33
Socio-cultural	2.59	0.84	0.00**	3.30	0.67	0.00*	3.28	0.67	0.01*
Psychological	2.74	0.87	0.06	3.41	0.78	0.00*	3.41	0.79	0.00*
Knowledge development	2.69	0.80	0.01	2.98	0.73	0.88	3.01	0.69	0.88
	Ottawa pre-event ($N=43$)			Ottawa during event ($N=43$)			Ottawa post-event ($N=43$)		
	Mean	SD	Significance	Mean	SD	Significance	Mean	SD	Significance
Economic	2.71	0.56	0.00**	2.62	0.49	0.00**	2.68	0.49	0.00**
Tourism	3.15	0.63	0.11	3.39	0.55	0.00*	3.35	0.54	0.00*
Environment	2.72	0.59	0.00**	2.91	0.51	0.27	2.95	0.49	0.57
Socio-cultural	2.86	0.64	0.16	3.23	0.48	0.00*	3.21	0.48	0.00*
Psychological	2.89	0.84	0.42	3.34	0.68	0.00*	3.34	0.71	0.00*
Knowledge development	2.91	0.62	0.37	2.99	0.53	0.92	3.06	0.58	0.44

*Significance $p<0.05$; ** indicates negative significant score; target value = 3, mid-point of the scale, 1 = does not meet my expectations at all to 5 = exceeds expectations.

Table 5. Independent sample *t*-test for differences between host and non-host residents on six legacy categories.

	Pre-event		During event		Post-event	
Importance	*t*	Significance	*t*	Significance	*T*	Significance
Economic	0.52	0.60	−0.16	0.87	−0.72	0.47
Tourism	1.16	0.24	−0.12	0.90	−0.08	0.93
Environment	0.47	0.63	−0.23	0.81	−0.40	0.68
Socio-cultural	−0.36	0.71	−1.14	0.25	−0.92	0.35
Psychological	0.01	0.98	−1.23	0.22	−1.56	0.12
Knowledge development	−0.20	0.83	−1.86	0.06	−1.93	0.05
	Pre-event		During event		Post-event	
Evaluations	*t*	Significance	*t*	Significance	*T*	Significance
Economic	−2.126	0.03*	−2.08	0.04*	−2.47	0.02*
Tourism	−0.548	0.58	0.03	0.97	0.40	0.69
Environment	−0.416	0.67	−0.44	0.65	−0.50	0.61
Socio-cultural	−1.650	0.10	0.56	0.57	0.51	0.61
Psychological	−0.805	0.42	0.41	0.68	0.39	0.69
Knowledge development	−1.426	0.15	−0.06	0.95	−0.38	0.70

*Significance $p < 0.05$.

event stage. An independent sample *t*-test was conducted to determine whether there were differences between males and females in each of the cities. The results revealed that for Ottawa male residents only differed in knowledge development outcomes from Ottawa females and only for the during the Olympic Games stage. The Ottawa male residents reported a higher mean score for knowledge development. For the Vancouver residents, a significant difference was found between male and female residents for the pre-event phase in the environmental importance category, with female residents reporting a higher mean score. A significant difference between Vancouver male and female residents was found pre-event for the evaluation of environmental, socio-cultural and knowledge development outcomes, with females reporting a higher mean score. During the event, the only significant difference found between Vancouver male and female residents was for the evaluation of economic legacy outcomes, with females reporting a higher mean score. Post-event no significant difference was found between males and females in both the host and non-host city.

For the third research question, paired sample *t*-tests were used to test the constructed variable term across the legacy categories and for the following stages: pre-during, during-post and pre-post event. For economic, knowledge development, environmental, and tourism, there were no changes before, during, and after the event in the perception and evaluation of legacy programs. Table 6 provides the mean scores and standard deviations of the newly created dependent variable (importance × evaluation outcomes) while Table 7 provides the results from the paired sample *t*-tests in more detail.

Table 6. Mean scores for interaction term (importance × evaluation outcome) of Vancouver and Ottawa residents.

Legacies	Vancouver pre-event ($N=41$)		Vancouver during event ($N=41$)		Vancouver post-event ($N=41$)	
	Mean	SD	Mean	SD	Mean	SD
Economic	8.73	4.36	8.16	3.35	8.11	3.13
Tourism	10.66	5.51	10.96	4.72	10.97	4.74
Environment	10.19	4.59	10.66	4.24	10.61	4.22
Socio-cultural	9.42	5.05	11.41	4.31	11.33	4.23
Psychological	9.94	5.71	11.48	5.32	11.40	5.24
Knowledge development	8.49	5.10	8.65	5.23	8.61	5.11
	Ottawa pre-event ($N=43$)		Ottawa during event ($N=43$)		Ottawa post-event ($N=43$)	
	Mean	SD	Mean	SD	Mean	SD
Economic	9.29	3.36	9.13	2.80	9.65	3.16
Tourism	9.96	4.51	10.89	4.42	10.68	4.30
Environment	9.83	3.56	10.71	3.16	10.83	3.34
Socio-cultural	10.24	4.06	11.59	3.39	11.45	3.58
Psychological	10.11	5.26	12.01	4.84	12.19	4.92
Knowledge development	9.05	3.71	9.57	3.59	9.74	3.82

Discussion

The purpose of this study was to (1) examine what legacies are important for the residents' and non-host residents' quality of life and whether they perform up to residents' expectations; (2) determine if there is a difference between host and non-host residents' perceptions of the importance and legacy outcome evaluation; and (3) examine if perceptions of importance and legacy outcome evaluation change over time. Looking at the results of this study, it was revealed that both host and non-host residents felt environmental legacies were the most important aspect, as it pertains to their quality of life at all three stages. This finding is in line with results from Andereck et al. (2007) who found the environmental category to have the highest importance mean score for quality of life. These results differ from a previous study that suggested non-host residents did not consider the importance of environmental aspects (Deccio & Baloglu, 2002). Perhaps, since the Deccio and Baloglu study was conducted the heightened societal awareness for environmental issues increased and contributed to enhance environmental legacy awareness among host and non-host residents (Andereck et al., 2007). For Vancouver (host residents), economic legacies were the second most important legacy at all three stages (pre-, during, and post-event), and socio-cultural legacies were the second most important legacy for Ottawa (non-host residents) at the pre-event and during phase. Post-event, Ottawa participants indicated that psychological legacies were the second most important legacy. Post-event, the economic aspects were deemed the second most important for the Ottawa residents' quality of life. These results are in line with the research by

Table 7. Paired sample *t*-test results of the interaction term accounting for importance and evaluation of legacy outcomes for the residents' quality of life.

	Vancouver			Ottawa		
	t	df	Significance	*t*	df	Significance
Economic pre-event–during event	1.01	40	0.31	0.34	42	0.72
Economic pre-event–post-event	1.19	40	0.23	−0.76	42	0.44
Economic during event–post-event	0.20	40	0.84	−1.95	42	0.06
Tourism pre-event–during event	−0.52	40	0.60	−1.60	42	0.11
Tourism pre-event–post-event	−0.23	39	0.81	−1.30	42	0.20
Tourism during event– ost-event	0.44	39	0.65	0.62	42	0.53
Environment pre-event–during event	−0.71	40	0.47	−1.89	42	0.06
Environment pre-event–post-event	−0.59	40	0.55	−1.93	42	0.06
Environment during event–post-event	0.20	40	0.84	−0.46	42	0.64
Socio-cultural pre-event–during event	−3.40	40	0.00*	−2.32	42	0.02*
Socio-cultural pre-event–post-event	−2.96	40	0.00*	−2.04	42	0.04*
Socio-cultural during event–post-event	0.36	40	0.71	0.47	42	0.63
Psychological pre-event–during event	−1.98	40	0.05	−2.64	42	0.01*
Psychological pre-event–post-event	−1.78	40	0.08	−2.69	42	0.01*
Psychological during event–post-event	0.22	40	0.82	−0.37	42	0.70
Knowledge development pre-event–during event	−0.23	40	0.81	−1.00	42	0.32
Knowledge development pre-event–post-event	−0.17	40	0.86	−1.46	42	0.15
Knowledge development during–post-event	0.10	40	0.91	−0.57	42	0.56

*Significance $p < 0.05$.

Andereck et al. (2007), who found that economic variables were rated most important, followed by socio-cultural variables.

In line with the results found by Andereck et al. (2007), the respondents provided lower evaluation scores than importance scores (all means below the mid-range) for all legacy categories with the exception of tourism legacies, which was found to meet expectation performances for both host and non-host residents at all three time points (mean scores just above the mid-range). Similar to Andereck et al. (2007), both host and non-host residents evaluated the outcome of the economic legacies below expectations throughout the duration of this study. Contrary to Andereck et al. (2007), during and post-event socio-cultural, and psychological legacies were evaluated and it was found that they met expectations. Contrary to previous literature where residents' felt there would be an economic gain from hosting the Olympic Games, economic legacies were evaluated significantly lower than the middle scale point for both the host and non-host residents at all three time points, indicating that economic expectations were not met (Perdue, Long, & Kang, 1999). Thus, this finding suggests that host and non-host residents perceived there would not be an economic gain from hosting the Olympic Games. Throughout all three time points, tourism legacies were evaluated higher than the middle scale point by all respondents to meet residents' expectations, a finding supported also by McGehee and Andereck (2004), who suggested tourism improved quality of life. Also, at the

during and post-event time points, both host and non-host residents evaluated psychological legacies significantly higher than the mean, indicating expectations were met, which is in line with results from Kim et al. (2006) that found an increase in psychological impacts post-World Cup. It should be noted that overall evaluation of the economic, tourism, environment, and knowledge development legacy scores were slightly higher for the Ottawa residents. This could be explained by the fact that Ottawa is not in close proximity to the event. As McGehee and Andereck (2004) and Cegielski and Mules (2002) found, increased awareness of negative tourism impacts among residents (in this case the hosting of a sport event is the tourist attraction), can form negative perceptions toward the event and will influence attitudes despite the existence of some positive impacts. Thus, the residents living closer to the event can experience negative impacts and, therefore, have a more negative perception about such outcomes. Since Vancouver directly experienced the impacts of hosting the Olympic Games, these residents were more likely to provide a more accurate assessment of the legacy outcome evaluation. The direct experiences of the host city residents can perhaps explain the lower evaluation scores. This finding contradicts previous studies where it is discussed that the further away residents live from a tourist attraction, the more negative their attitudes become (Ap, 1992; Williams & Lawson, 2000). The differences between males and females were significant but moderate and were found mainly in the outcome evaluations of the environmental, socio-cultural and knowledge development legacies pre-event for the host residents. More specifically, during the Olympic Games there were differences between males and females evaluation of the economic legacies, results supported by Ritchie, Shipway, and Cleeve (2009). However, at the post-event phase no differences were found between males and females for all residents and all cities. Similar results were also found by Preuss and Werkmann (2011) where the only significant differences between males and females were found for infrastructure and image improvement. With regard to all other legacies, no differences between males and females were found (Preuss & Werkmann, 2011). This could be explained by the confirmation–disconfirmation paradigm in that pre-event and during event outcome evaluation differences for males and females were found. However, post-event evaluations indicated that neither males nor females expectations were met (disconfirmation) for the economic legacy outcomes while expectations were met (confirmation) for the tourism, socio-cultural, and psychological legacy outcomes.

With regard to tourism, this study corroborates findings of previous literature, which suggests that hosting the Olympic Games provides the host city an opportunity to showcase its tourist attractions and its newly generated infrastructure (Chalip, 2002; McGehee & Andereck, 2004; Owen, 2005; Whitson & Horne, 2006). The latter studies also allude to the improvement in residents' quality of life because of such changes. Since the Ottawa residents are not directly impacted by the tourism industry in Vancouver or experience any of the infrastructure created for the Olympic Games, they relate to the Olympic Games through psychological factors such as pride for hosting the event or the performance of the Canadian athletes.

For both cities, as time progressed, mean scores for the importance ranking of legacy categories began decreasing while the evaluation of legacy performance outcomes increased. It is also important to note that the evaluation of economic legacy performance outcomes decreased as time progressed for both cities. These changes in mean scores support the dynamic nature of social exchange theory, which

suggests that evaluations are not permanent; over time residents reassess perceived benefits and costs (Waitt, 2003). Therefore, social exchange theory can explain the lower importance scores, suggesting that as residents began to experience the legacies from hosting the Olympic Games, the reference point established at the pre-event stage was not met, and, therefore, reference points for the importance perceptions were set at lower levels for the during and post-event phases. As for the evaluation of the legacy outcomes (relating to quality of life), this study supports the results from Kim et al. (2006) in which all participants felt that psychological legacies met expectations, while economic legacies failed to meet expectations over the three time points.

The paired sample *t*-tests of the variable that took into account both importance rating and evaluation ratings indicated that there was a significant difference for Vancouver and Ottawa residents, with respect to the socio-cultural legacies, between the pre-event and the during event phase and between the pre-event and post-event phase. These results suggest that resident attitudes and thoughts are formed mainly before and after the event, while during the event can be considered the experience stage. Furthermore, for Ottawa residents a significant difference was found for the psychological legacies between the pre-event and during phases and between the pre-event and post-event phases. These results support social exchange theory and the findings from Kim et al. (2006) in that there were instances where significant changes occurred over time between the pre-event and the during-event phases. From the pre-event to the during-event phase, tourism, environmental, socio-cultural, psychological, and knowledge development mean scores increased, suggesting that the importance and evaluation of legacy outcomes were either met or exceeded (with the exception of economic legacies, where scores decreased as time progressed). From the during-event phase to the post-event phase, scores slightly decreased, suggesting that importance was lower and evaluation of legacy outcomes was lower after the event. The significant changes over time in the socio-cultural legacies support the findings of Kim et al. (2006), who found that residents from the 2002 World Cup experienced more societal and cultural benefits than economic benefits. Perhaps, the fact that Canada was hosting the Olympic Games; it was the first winter Olympic Games in which a Canadian team or athlete won a gold medal on home soil; and the men's hockey team winning the gold medal boosted the psychological legacy evaluations.

Practical implications

By gaining an understanding of how legacies are evaluated, event organizers, the host nation and the IOC can focus resources into improving legacy programs that residents feel are beneficial for their quality of life at both the national and local level. The results of this study are important for sport managers and planners for several reasons. First, this study examined quality of life aspects within the context of host and non-host residents' communities, rather than focusing on just the host residents, an approach often taken by other resident attitude studies. Second, this study measured the evaluation of legacy outcomes as they relate to quality of life, a relationship which in the mega-event literature has not been explored, to the authors' knowledge.

Identifying what legacies are important and whether they are evaluated to meet expectations over time provides sport managers and event planners with useful information for long-term quality of life consequences for residents. These consequences should be considered during the planning phase for hosting a

mega-event. In the case of Vancouver, environmental, economic, and socio-cultural legacies were most important for residents' quality of life. For another mega-event, similar or different legacies may be of essence to local people. The findings of this study thus suggest that not all legacies are important to residents, but that some certainly are more important than others which may satisfy the residents' expectations. Thus, event organizers and planners can identify the areas that need support or improvement. Identification of problem areas should alert governments to direct more federal funds towards these projects. This in turn can enhance residents' support and help alleviate any dissatisfaction or negative attitudes. If residents perceive that legacies important to them benefited their quality of life, support for future events can be achieved. With both resident groups indicating the importance of the environmental legacies, organizers should ensure that venues and facilities created for the Olympic Games are converted to meet community needs, so that residents can utilize and benefit from their use once the Games are over (sustainable use of facilities). Furthermore, organizers need to plan appropriately and establish clear policies for environmental protection and conservation to ensure that damage to the local environment is minimal. Organizers and planners should further communicate accurate impacts that consider both the potential positive and negative impacts that residents' may experience. As Fredline (2005) suggests, if positive impacts are accurately communicated to residents and a perceived positive impact is experienced, the event will be considered a success and support for future events will be provided. To maximize psychological legacies, organizers should collaborate with different tourism and government agencies in order to create a festive atmosphere and celebrate the Olympic Games as a whole country during the event. Furthermore, creating volunteer opportunities to engage host and non-host residents can increase positive experiences and provide these individuals with a feeling of inclusion and community or national unity adding to the socio-cultural legacy.

This longitudinal study is useful because it helps identify how importance and evaluation of legacies change over time. The results revealed that main differences in perceptions happened between the pre- and post-event stages. Looking at residents' perceptions before the event can help organizers address any concerns or problem areas early and thus being proactive in their planning efforts. During the event, organizers and event planners can focus on successfully delivering the event given that most changes in perceptions took place between the pre- and post-event phases.

In the current study, residents identified the importance of environmental legacies and it was revealed that, although important, the environmental legacies did not perform to expectations and, therefore, were not satisfactory. If major environmental initiatives are undertaken by the host city, then pertinent media communications have to take place to allow the proper assessment of these legacies by the residents.

Theoretical implications

The theoretical implications of this study include the differential weight of legacy outcomes for host and non-host residents and the dynamic processes involved in the evaluation for some legacy categories and not others. This study found that change only existed in some legacy areas, not on the importance perceptions but on the evaluation of legacy outcomes. Residents indicated that the importance of legacies as it relates to quality of life did not change over time, but it was found that the evaluation of legacy

outcomes changed over time especially from pre- to post-event but not so much from during to post-event. The latter also contributes to the research methodology related to the timing of measurement of resident perceptions of legacy outcomes. Perhaps, focusing only on the pre- and post-event stages for measurement is adequate for comparison and identification of changes in perceptions regarding legacy outcomes.

Limitations

One main limitation of this study is related to its small sample size. However, the researchers took necessary steps to show the representatives of the sample. Still, the results should be interpreted with caution. Second, both samples were fairly interested in the Olympic Games. When statistically compared, using a *t*-test, non-host residents had a higher mean score in their interest in sport, which could have affected their opinions. However, it is important to note that in the current study, at the post-event time phase, no differences where found between host and non-host residents with the exception of the evaluation of economic legacies. Longitudinal studies tend to have problems with mortality and attrition (which may account for a minor loss of respondents over the course of the three phases of this study). Also, by using the phone book to select participants, the study did not include those residents who do not own a residential line. Furthermore, testing response could be a limitation (i.e., once respondents are asked about the importance and performance questions they could be looking for them or develop expectations about them because of being exposed to the survey). Perhaps, this threat to internal validity could have affected the scores that did not show differences between the two groups. Finally, the legacies in this study were evaluated based on residents' perceptions and not on objective indicators which could present a different picture.

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Appendix 1

Legacy categories	Items	Scale
Economic (5 items)	• Increase of employment opportunities • Increase of local business opportunities • Improvement of public welfare • Lack of debt from hosting the Olympic Games • Avoid the raise of property costs and rent due to the Olympic Games	Respondents were asked to rate how important each item was to them as it relates to hosting the Olympic Games for their overall quality of life on a 5-point Likert Scale. Where: 1 = not at all important 2 = somewhat important 3 = important 4 = very important 5 = extremely important
Tourism (5 items)	• Development of tourism infrastructure • Improvement of community image • Increase of tourism	The same variables and items were used in a follow up question for respondents to indicate how these items performed. Respondents were

(*Continued*)

Legacy categories	Items	Scale
	• Better circumstances for corporate companies relocation • Awareness of British Columbia as tourism destination	asked how did[a] YOU EXPECT the following characteristics to perform as they relate to the hosting of the Olympic Games to improve your quality of life on a similar 5 point Likert Scale. Where: 1 = does not meet my expectations at all 2 = below expectations 3 = meets expectations 4 = above expectations 5 = exceeds expectations
Environmental (8 items)	• Urban regeneration • Development of sport infrastructure • Use of sustainable/ environmental practices to build facilities • Build only necessary infrastructure that will be used after the Olympic Games • Lack of crowding • Lack of environmental damage • Plan for proper waste disposal (avoid pollution) • Avoid traffic congestion	
Socio-cultural (4 items)	• Improved cultural experience • Improvement of education opportunities related to the Olympic Games • Improvement of athletic achievement • Avoidance of residence displacement from their home due to the Olympic Games	
Psychological (2 items)	• Renewed community spirit • Opportunity to experience the Olympic Games	
Knowledge development (3 items)	• Improved inter-governmental cooperation due to the Olympic Games • Acquirement of experience in hosting sports events • Gain new knowledge and personal skills by volunteering for such an event	

[a]Note: slight change in wording to reflect the time of questioning at the pre-event, during, and post phase.