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Mapping research on legacy of mega sporting events: structural changes, consequences, and stakeholder evaluations in empirical studies

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ABSTRACT

Findings from empirical studies on the legacy of hosting a mega sporting event are inconclusive. This paper considers empirical studies published in English language peer-reviewed journals between 1997 and 2016 to identify trends and gaps in current knowledge related to event-attributed changes in structures, consequences, and stakeholder evaluations. Following systematic literature search guidelines, 233 articles (238 studies) were coded. The authors assessed structural changes, consequences, and stakeholder evaluations. Contextual factors, such as type of event, timeframe, and geographical location were also considered, as well as research design, methods, and a risk of bias assessment. Most studies considered structural changes per se, without further specification (such as the urban and human level). Economic and social consequences were the two most often considered consequences. The range of stakeholders considered in the studies was diverse, although host city residents received the most research attention. The mapping helps scholars better understand dominant themes, critically appraise studies as well as identify gaps in existing research. The authors discuss managerial implications and propose research directions that address concerns: unclear definition and biased selection of relevant stakeholder groups, short legacy timeframes, and the low-level evidence for cause-effect relationships in the legacy production process.

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Introduction

Sporting events have become a key area of leisure research and practice. According to Müller (2015), mega sporting events are 'ambulatory occasions of a fixed duration that attract a large number of visitors, have a large mediated reach, come with large costs, and have large impacts on the built environment and the population' (p. 8). These include the Olympic Games (Summer and Winter), the soccer World and European championships (men), and the Asian Games (Müller, 2015). Historically, these events were assumed to deliver long-term benefits for hosts, yet

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escalating costs, claims of political misappropriation, and growing stakeholder scrutiny has placed this assumption under question (Preuss, 2019). In response, event planning committees have revised policies to focus on legacy. Although legacy definitions have been contentious, one widely used definition states that legacies are 'all planned and unplanned, positive and negative, tangible and intangible structures created for and by a sport event that remain longer than the event itself' (Preuss, 2007, p. 211). Despite the importance of structural changes in this definition, most research has disaggregated the concept of legacy to focus narrowly on 'impacts' associated with selected aspects (Preuss, 2015). This has limited more holistic conceptualisations of legacy as a process, which is critical to theoretically linking structural changes to both short- and long-term consequences. There is currently a lack of clarity regarding who is influenced by sporting event legacies, or how influences might vary across different stakeholder groups (Preuss, 2019).

This highlights the importance of mapping existing empirical research to structure findings related to the legacy process, highlight key substantive and methodological trends, and uncover promising areas for future enquiry (Babiak, Thibault, & Willem, 2018). In particular, consolidating the field to understand reviews despite their importance the associations between different legacy processes remains an important gap in the literature. We pose the following three research questions: (1) What aspects of the legacy process, referring to three dimensions (i.e. changes in structures, consequences, and stakeholder evaluations), have been researched most frequently? (2) What are the components of, and interrelationships between, these dimensions? (3) What are the findings of these studies? The assessment will help determine the directions for future studies based on the foci as well as the strengths and weaknesses of previous studies. Furthermore, it will inform researchers who aim to develop theory in the area of sport event legacy.

Literature review

To date, seven systematic reviews and one review of systematic reviews (Mahtani et al., 2013) have focused on aspects of sporting event legacies (Table 1). While these reviews are important contributions to knowledge, six of the eight reviews do not focus broadly on mega sporting events (i.e. they specifically look at the 2012 London Olympic and Paralympic Games, Summer and Winter Games, or Paralympic Games). The two that considered mega events in general (Li & Jago, 2013; McCartney et al., 2010) included events that are not classified as mega sporting events according to Müller (2015), such as the Goodwill Games, the Commonwealth Games, and even fairly local running events. Moreover, six of the eight reviews only focused on specific aspects of legacy (i.e. physical activity, health, urban, tourism, and [socio-]economic factors, respectively), thus limiting opportunities to develop more holistic conceptualisations. Environmental themes, for example, are completely absent in these reviews despite their importance to the overall concept of legacy (Death, 2011). One review explicitly considers legacy as a process (Gaudette, Roult, & Lefebvre, 2017); the others do not. Finally, it is worth noting that not all reviews included a risk of bias assessment, which seems necessary given previously determined methodological concerns in the field (McCartney et al., 2010).

Aside from the different conceptualisations of legacy evident in the literature (Preuss, 2015, 2019), researchers currently lack process-related frameworks to study legacy (Thomson et al., 2019). Process theories – also referred to as theories of change – have been utilised in a variety of fields to understand how and why certain organisations, events, or initiatives work. They describe outcomes, which are evaluated and linked back to particular process components. The application of process theories is especially important to the study of legacy, as investments in process components (e.g. infrastructure) are often made with the assumption that they contribute positively to one or more legacy outcomes (Preuss, 2007; Rowe, 2012). Process theories offer much needed accountability to these assertions by linking planned and unplanned, positive and negative legacy outcomes to specific process components, and evaluating their benefit relative to social, political, and financial costs (Nichols & Ralston, 2015).

Table 1. Overviews of previous literature reviews of research on mega sporting event legacy.

Authors (year) and publication outlet	Type of paper	Focus on mega sporting events	Date of publication of studies considered	Key variables mentioned in the research goals of the paper
Present study (2019)	Mapping of literature based on systematic search	Yes	1997-2016	Structural changes, consequences, and stakeholder evaluations; methods and contexts
[1] Thomson et al. (2019), *Sport Management Review*	Systematic review supported by NVivo	No	2000-2016	Contexts; types of legacy; foci; theories; designs
[2] Gaudette et al. (2017), *Journal of Sport & Tourism*	Systematic review	Yes, Winter Olympics	2000-2017	Urban- and tourism-related effecs; methods
[3] Weed et al. (2015), *European Sport Management Quarterly*	Systematic review	Yes, Olympics	1990-2008	Sport participation; leveraging processes
[4] Li and Jago (2013), *Current Issues in Tourism*	(Review of) systematic review, meta-analysis	No	–2011	Economic impact evaluations
[5] Mahtani et al. (2013), *BMJ Open*	Review of systematic reviews	No	–2012	Physical activity and sport participation
[6] McCartney et al. (2010), *British Medical Journal*	Systematic review	No	1978-2008	Health and socioeconomic determinants of health
[7] Kasimati (2003), *International Journal of Tourism Research*	Systematic review	Yes, Summer Olympics	Unclear	Economic impact evaluations
[8] Weed et al. (2009), report	Systematic review	Yes, Olympics	2012	(Intended) physical activity, sport, and health outcomes; leveraging processes; evaluation tools

Authors (year) and publication outlet	Proposal or use of a legacy framework in the paper …		Number of studies considered in the paper and nature	Assessment of risk of bias of studies considered	Key findings of the paper
	… with multiple dimensions	… with procedural character			
Present study (2019)	Yes	Yes	238 peer-reviewed empirical studies, 233 articles	Yes, high risk	Specific event structures were rarely considered, arguing for a myopic perspective; economic and social consequences dominate; important stakeholders were neglected; processes and interrelationships were rarely studied and post-event timeframes are rather short
[1] Thomson et al. (2019), *Sport Management Review*	Yes	No	305 peer-reviewed articles	No	A two-dimensional wall of knowledge displays 12 legacy types and nine investigation foci; there is limited engagement with theories; there are patterns of published studies and research gaps
[2] Gaudette et al. (2017), *Journal of Sport & Tourism*	Yes	Yes	47 peer-reviewed articles	No	Findings are presented according to venue and whether legacy dealt with planning or post-event outcomes (urban-related effects); and according to venue, stream, tangible, and intangible (tourism-related effects)
[3] Weed et al. (2015), *European Sport Management Quarterly*	Yes	No	21 books, reports or journal articles	Yes, mixed	There is weak evidence for a demonstration effect that can be categorised along the event and its success as well as local vs. general and sport participation (number of people, frequency of sport, changes in activities)

(*Continued*)

Table 1. (Continued).

Authors (year) and publication outlet	Proposal or use of a legacy framework in the paper …		Number of studies considered in the paper and nature	Assessment of risk of bias of studies considered	Key findings of the paper
	… with multiple dimensions	… with procedural character			
[4] Li and Jago (2013), *Current Issues in Tourism*	No	No	27 book chapters, working papers, reports or journal articles	No	Simple input-output models are replaced by computable general equilibrium models; more and more full (vs. only indirect) effects are considered as well as wide (vs. only event tourism) expenditures
[5] Mahtani et al. (2013), *BMJ Open*	No	No	Two systematic reviews [6,8]	No	There is no evidence for positive effects on physical activity or sport participation in the general population
[6] McCartney et al. (2010), *British Medical Journal*	Yes	No	54, thereof 25 from grey literature	Yes, high risk	There is little evidence for effects on health or its socioeconomic determinants; there are important gaps in the range of outcomes considered
[7] Kasimati (2003), *International Journal of Tourism Research*	No	No	13, nature unclear	No	Differentiation between ex-ante and ex-post assessments; monetary figures are provided depending on releasing author or institution
[8] Weed et al. (2009), report	Yes	No	54, nature unclear	Yes, mixed	Poor evidence on the generation of positive outcomes; no evidence for demonstration effect and little evidence for leveraging processes; volunteering and festivity aspects are important leveraging factors; various evaluation tools have been used

This highlights the importance of accounting for the multiple stakeholders involved in hosting processes. From a managerial perspective, potential differences in preferences among stakeholders are important because they influence the formation of opinions as well as decisions that relate to the allocation of resources. Legacy outcomes and the process components leveraged to achieve them do not influence stakeholder groups equally, and in some instances the benefits that accrue to certain stakeholders may be offset (or even come at the expense) of negative outcomes for others (Mackintosh, Darko, & May-Wilkins, 2016). Stakeholder theory provides a useful lens to capture these differences by detailing how legacy processes identify, balance, and manage the diverse interests of stakeholder groups (Laplume, Sonpar, & Litz, 2008). There remains limited synthesis of how stakeholders' perspectives and evaluations of legacy processes have been incorporated into empirical studies. By focusing on empirical research, this study will help researchers contextualise and situate their findings within the broader literature, and elucidate the complexity and interrelatedness of different components to inform theory development.

Mega sporting event legacy conceptual framework

The conceptual distinction between different layers of the legacy process is important to understand how legacy develops and how it can be evaluated. Our framework includes the following procedural dimensions: changes in structures, consequences, and stakeholder evaluations (Preuss, 2019; see also IOC, 2017). We define them as follows: (1) event-attributed structural changes are new or altered objects, concepts, or ideas that are put in place because of the event hosting; (2) consequences describe the effects caused by these changes; and (3) stakeholder evaluations are opinions of people or institutions that affect, or are affected by, the hosting of a sporting event. The conceptual framework served as the guiding framework for our analysis (Figure 1).

Methods

Procedure

Academic databases (Business Source Complete, ERIC, SciELO, Science Direct, SCOPUS, SportDiscus, SocIndex, and Web of Science) were searched using the guidelines developed by the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) group (Moher, Liberati, Tetzlaff, & Altman, 2009). We searched articles that were published in peer-reviewed journals between 1 January 1997 and 31 December 2016 using the following search terms (abstract, title, or keywords): (["Mega?Sport*?Event" OR "Major?Sport*?Event"] AND [Legac* OR Impact* OR Effect* OR Consequence* OR Leverag* OR Sustainab*]). The results of the search process are shown in Figure 2. Two researchers applied exclusion criteria defined in advance and agreed upon by the research team. Most importantly, articles that were not empirical in nature (no matter what scientific field they were grounded in) were excluded, allowing an evaluation of the empirical findings and risks of biases of studies. After applying the exclusion criteria, we identified 238 studies (i.e. five papers considered different studies within one paper, with own methods and results sections).

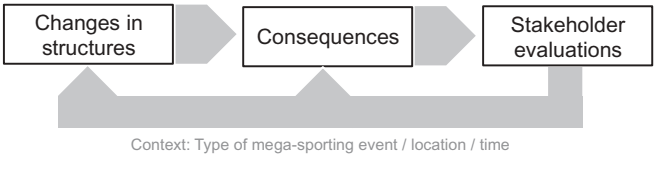

Figure 1. Conceptual framework for the legacy of mega sporting events.

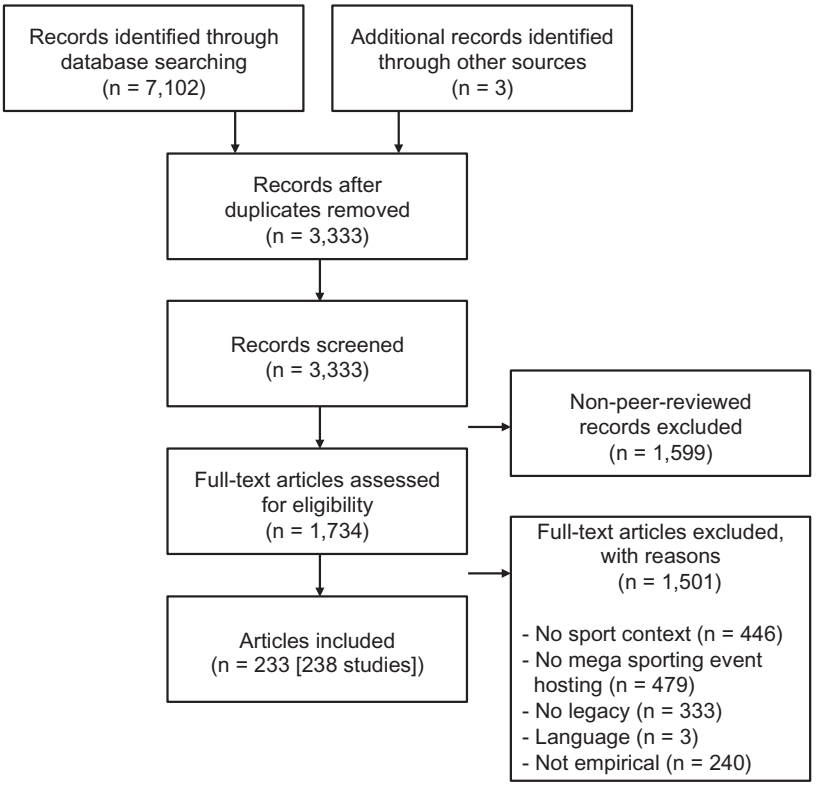

Figure 2. Overview of the search strategy.

Conceptual framework and coding scheme

The conceptual framework that underlies the study includes (1) event-attributed changes in structures, (2) consequences of the changes in structures, and (3) and stakeholder evaluations, considered higher-level coding categories. Snilstveit, Oliver, and Vojtkova (2012) note that the use of a coding framework is justified where the research question driving the analysis relates to defining or framing an issue, or to understanding implementation of a programme or policy (in this case, the legacy process).

Within the higher-level categories, second-level categories were developed inductively. Content analysis was used to describe key findings of the studies with regard to these second levels. We used an inductive content analysis approach as suggested by Marshall and Rossman (1999). This involved reading selected articles to identify themes and patterns that emerged from the text. It was informed by Hsieh and Shannon (2005) and based on previous systematic literature searches. Through a process of open coding, we independently developed codes for describing key findings and different concepts related to the legacy of sporting events addressed in the articles. Initial lists of codes were compared, discussed, and consolidated, and finally refined by two authors. We then revisited the articles to further code broader themes of findings within the three deductively derived higher-level categories. Standard inter-coder reliability criteria were met (Appendix).

Risk of bias

Risk of bias was coded differently for qualitative studies and quantitative studies, as suggested by Higgins and Green (2011). Codebooks were created for quantitative, qualitative, and mixed methods studies based on adapting identified risk of bias assessment frameworks. For quantitative

studies, we adapted Jackson and Waters' (2005) Effective Public Health Practice Project Quality Assessment Tool (EPHPP). Qualitative studies require different assessment tools due to their goals and nature (Higgins & Green, 2011). Therefore, we selected eleven indicators plus one global indicator (Spencer, 2003). Studies that used both a quantitative and a qualitative design were coded using both tools. Frameworks selected to inform initial codebooks were chosen due to their breadth of assessment indicators, their development within transdisciplinary research fields, and previous demonstration of inter-rater agreement and validation of scoring procedures.

Results

Risk of bias assessment

The mean risk of bias scores for all articles was M = 2.5 (SD = 0.5). The average overall risk of bias of the quantitative studies was M = 2.2 (SD = 0.5); for qualitative studies, it was M = 2.8 (SD = 0.4); for mixed method studies, it was M = 2.9 (SD = 0.3). Sampling strategies used by the studies had particularly weak ratings based on the risk of bias assessment tools. For example, of those studies that included informants in the study (n = 145), 40 did not state what sampling strategy they used and another 67 studies used convenience sampling. Another issue relates to flawed data. Yu et al. (2016) assessed the air quality in the context of the hosting of the 2008 Olympic Games in Beijing. However, Stoerk (2016) provides statistical evidence for corruption in Beijing's air quality data between 2008 and 2012.

Design and methods of the studies

About 42.4% of the studies were exploratory. Fewer studies primarily aimed to assess correlational relationships between variables (29.4%), describe a topic (20.2%), and (quasi-) experimentally assess explicative relationships between variables (14.3%). (Note that multiple coding was possible.) About 64.7% of the studies used primary data and 52.1% used secondary data in their analyses (16.8% used both). Of the studies that used primary data, 48.7% exclusively worked quantitatively, 35.7% exclusively worked qualitatively, and 15.6% followed a mixed method approach. Table 2 summarises these findings and presents the data basis of the primary-data based studies (with quantitative surveys and qualitative interviews as the main tools used to gather the data; 59.1% and 44.8% of the studies, respectively).

Table 2. Research designs and methods of the 154 studies that used primary data sources.

Research design	Studies (%)	Quantitative vs. qualitative design	Studies (%)	Data basis	Studies (%)
Cross-sectional (one-time)	64.3	Quantitative	48.7	Quantitative survey	59.1
Cross-sectional (repeat)	18.8	Qualitative	35.7	Qualitative interviews	44.8
Longitudinal	18.8	Mixed methods	15.6	Documents and media reports	24.0
Control group inclusion	0.0	-	-	Case-study data	16.9
-	-	-	-	Observations	11.7
-	-	-	-	Ethnographic-study data	3.2
-	-	-	-	Direct measurements	1.9
Number of studies*	N = 154	Number of studies	N = 154	Number of studies*	N = 154

Notes. *Total is greater than 100% due to some studies following multiple research designs or using multiple methods as a data basis.

Study characteristics, trends, and contextual setting

The studies focused on the following events: the Olympic Games (50.4% Summer and 20.2% Winter), the FIFA World Cup (33.2%), the UEFA Euro (4.6%), and the Asian Games (1.7%). We note that some studies considered more than one of these events (or types of events).

The primary-data based studies that indicated a timeframe in the methods section (135 out of 154 studies) considered a timeframe of 17.6 months on average (SD = 32.9, range between 0 and 96 months). The average point of measurement of legacy was 4.1 months after the event (SD = 30.2, range between 104 months prior to the event and 127 months after the event). We note that this point in time is relatively close to the hosting, bearing in mind that most legacy consequences of structural changes occur after years (Preuss, 2015). The secondary-data based studies that reported timeframes (103 out of 124 studies; this includes 40 studies that used both primary and secondary data) considered a timeframe of 89.8 months on average (SD = 118.8, range between 0 and 684 months). The average point of measurement of legacy was 29.9 months after the event (SD = 93.1, range between 132 months prior to, and 684 months after, the event).

Procedural dimensions of legacy

Event-attributed structures

Most studies did not consider specific structures (47.1%; 112 out of 238 considered them), while others referred to social (26.1%), urban (19.7%), and human (16.0%) factors, policy, governance, and regulation (9.7%), environmental factors (8.0%), and intellectual property (7.6%; Table 3).

Consequences

The researchers mostly considered economic and social consequences: they were considered in 46.6% and 33.2% of all studies, respectively. Sport-related (16.8%), urban area-related (11.8%), environmental, political, and community-related (10.1%, 9.7%, and 9.7%, respectively), as well as security and surveillance-related consequences and others (6.3% each) follow (Table 3).

Table 3 reveals some interesting patterns related to the consideration of both structures and consequences. For example, economic consequences were often considered in studies that referred to event-attributed structures of social, urban, and hosting per se (i.e. when no specific structures

Table 3. Consequences considered in the studies depending on event-attributed structural changes.

	Overall (% of all studies)	No specific structures mentioned (number of studies)	Social factors (number of studies)	Urban factors (number of studies)	Human factors (number of studies)	Policy, governance, and regulation (number of studies)	Environmental factors (number of studies)	Intellectual property (number of studies)
Economic	46	63	40	27	8	6	8	3
Social	33	32	46	19	11	7	9	3
Sport-related	17	15	14	7	16	8	5	6
Urban area-related	12	6	14	22	5	5	6	2
Community-related	10	5	7	9	10	4	4	5
Environmental	10	11	12	6	4	2	14	1
Political	10	6	13	4	2	12	2	3
Security and surveillance-related	6	10	7	4	0	3	1	0
Others	6	3	4	3	4	3	0	5
Number of studies*	N = 238	N = 112	N = 62	N = 47	N = 38	N = 23	N = 19	N = 18

Notes. *Total across the categories of structures is greater than 238 due to some studies considering multiple structures; total within each of the categories of the structures is greater than 100% (as a percentage of sample size) due to some studies considering multiple consequences.

were mentioned), while there are relatively few studies that considered economic consequences of human, policy, governance, and regulation, environmental, and intellectual property structures.

Stakeholders

Thirty-one categories of stakeholders, based on the differentiation between persons and organisations as well as their roles and identities (ranging from individuals as host-region residents to individuals as environmentalists; see Table 4), were considered. Individuals as host-region inhabitants (25.0%), countries (14.8%, most often in relation to their GDP), governments (13.9%), individuals as customers (including tourists, 13.3%), organising committees (13.3%), and individuals as non-host region inhabitants (10.8%) were most often considered in the studies.

Stakeholders made the following evaluations, according to the coding (excluding 78 studies that could not be coded due to lack of information or inappropriate designs to draw these conclusions): 62.5% positive, 48.1% negative, and 24.4% equally positive and negative. Note that multiple coding was possible, as several variables could be considered in the studies with potentially conflicting results. The following evaluation tools were used (multiple coding was possible): perceptions (61.8%), documents (31.9%), financial figures (21.4%), and people's behaviour (observations) (8.0%).

Interrelationships of procedural dimensions

Mapping empirical literature in accordance with our conceptual framework also helped identify interrelationships within and across different procedural dimensions. To organise this analysis, we present a summary of findings pertaining to each structural change included in our framework.

Social factors

Articles focused on the role of events in promoting social cohesion and inclusion in host nations. For the most part, hosting of events resulted in few positive social development outcomes and any reported positive changes were typically limited in duration. Often identified as the feel good factor of hosting events, studies examined outcomes such as psychic income, social capital, community engagement, and national identity (Gibson et al., 2014; Pfitzner & Koenigstorfer, 2016). While some studies demonstrated short-term increases in these indicators, these often returned to pre-event norms when follow-up studies were conducted. Positive consequences were more often associated with events that intentionally incorporated social inclusion strategies into their hosting strategy early in the process. For example, Sydney's inclusion of Australian aborigines within the 2000 Olympic Games planning and implementation may have helped prevent social disruption and increase visibility of the Games' more progressive social agenda (Rowe, 2012). When researchers included stakeholders from different social strata as well as examined multiple stakeholders' perspectives, studies often uncovered contradictory perceptions of an event's social effects. This resulted in socially excluded populations more likely to perceive no or negative social outcomes as a result of hosting the event (Mackintosh et al., 2016; McGillivray, 2014).

Urban factors

Event-attributed urban and regeneration structures were common areas of enquiry. Stadium and event construction (Alm, Solberg, Storm, & Jakobsen, 2016; Solberg & Preuss, 2015), modifications and changes to transportation infrastructure (Parkes, Jopson, & Marsden, 2016; Singh & Hu, 2008), and commercial/residential development projects (Cabral & Silva, 2013; Weed, 2014) were especially prominent. The consequences associated with these structures were evaluated as either positive or negative, yet most studies indicated the direction and magnitude of evaluations varied depending on stakeholders and context. For example, Alm et al. (2016) found that publicly owned venues were less likely to be utilised after events than commercially owned venues, and that corruption and economic conditions also influenced post-event facility utilisation. Similarly,

Table 4. Stakeholders considered depending on event-attributed structural changes taken into account in the studies.

	Overall (% of all studies)	No specific structures mentioned (number of studies)	Social development (number of studies)	Urban development (number of studies)	Human development (number of studies)	Policy, gover-nance, and regulation (number of studies)	Environmental development (number of studies)	Intellectual property (number of studies)
Individuals as host-region inhabitants	25	23	24	19	11	11	13	3
Countries	14	19	9	8	1	1	1	0
Governments	13	3	10	9	8	8	3	5
Individuals as customers (including tourists)	13	15	16	3	1	1	1	3
Organising committees	13	6	12	7	8	8	4	5
Individuals as non-host region inhabitants	11	17	9	2	5	5	2	1
Legacy management board	8	3	6	5	0	0	2	1
Industries and trade councils	7	10	3	5	2	2	0	1
City representatives	7	3	3	3	5	5	1	1
Individuals as employees	6	4	1	2	7	7	1	2
Non-profit organisations	5	2	1	2	6	6	3	5
Local politicians	5	3	1	3	5	5	1	2
Sport federations	5	0	3	2	5	5	0	4
Sport governing bodies	5	1	5	3	4	4	0	1
Individuals as volunteers	5	4	1	0	7	7	0	0
Media	5	3	7	3	0	0	1	1
Community representatives	4	1	1	2	5	5	1	2
Individuals as physically active persons	4	4	1	1	4	4	0	0
Companies as sellers of goods and services	3	2	0	2	3	3	0	0
Companies as sponsors	3	2	1	1	0	0	1	1
Social welfare organisations	3	2	1	0	2	2	0	2
Education institutions	3	2	2	2	3	3	1	2
Individuals as targets of event sponsors	3	6	0	0	0	0	0	2
Visitor centres	2	0	4	4	0	0	1	0
Stadium owners and management	2	0	1	4	1	1	1	0
Police	1	1	1	1	0	0	1	0
Individuals as voters	1	2	0	0	0	0	0	0
Individuals in need or with disadvantages	1	1	0	2	0	0	0	0
Trusts	1	0	1	1	3	3	0	1
Health providers	1	1	1	1	1	1	0	0
Individuals as environmentalists	0	0	0	0	0	0	1	0
Number of studies*	N = 238	N = 112	N = 62	N = 47	N = 38	N = 23	N = 19	N = 18

Notes. *Total across the different categories of structures is greater than 238 due to some studies considering multiple structures; total within each of the categories of the structures is greater than 100% (as a percentage of sample size) due to some studies encapsulating multiple stakeholders.

Jones, Woolley, and Currie (2015) indicated the success of travel management plans was contingent upon business type, with smaller firms often struggling to integrate strategies and absorb losses in productivity.

Human factors

A large number of articles generally focused on the legacy of sporting events to develop skills and competencies among volunteers and other stakeholders that could be transferred to subsequent community-based volunteering or community capacity building. The outcomes of these studies suggested more positive outcomes related to human factors than other structures. Volunteers with events reported increased skills and abilities because of their volunteer experiences, as well as evidence of continued or increased volunteering following the event (Fairley, Lovegrove, Newland, & Green, 2016; Neufeind, Güntert, & Wehner, 2013). However, the research also suggested that positive volunteer outcomes might be limited to certain stakeholder groups. Specific processes being in place were also seemingly required to attain positive human development outcomes. For example, the inclusion of democratic processes, transparent engagement, and intentional management strategies (e.g. communication, strategic planning, and socialisation) within the organising committee's structures were critical to ensuring positive human development outcomes (Nichols & Ralston, 2015; Parent & MacIntosh, 2013).

Policy, governance, and regulation

Studies on change to policy, governance and regulation focused on the interplay between the organising committee for the Olympic Games, host organising committees, local/national governments, and other related public/private agencies (Parent, 2016; Parkes Lettieri, et al., 2016). For example, Singh and Hu (2008) analysed the coordination between host organising committees and destination marketing agencies at the Athens 2004 Games, Parent (2016) explored the democratic governance systems of the Vancouver 2010 Games, and Parkes, Jopson, et al. (2016) focused on travel policies implemented as part of the London 2012 Games. Politics-focused studies examined how events influenced international image (Grix & Houlihan, 2014). Each of these studies considered the longevity of event-related policy, which provided insight into how specific strategies influenced long-term consequences. For example, Singh and Hu (2008) indicated that both event and destination marketing could have been improved through more strategic coordination between the Athens Organising Committee and Greek National Tourism Organisation, while Parent (2016) identified four principles that were key to building and promoting knowledge transfer among local stakeholders (i.e. performance, accountability, transparency, and participation).

Environmental factors

Articles that predominately focused on environmental factors were not as common. Jin, Zhang, Ma, and Connaughton (2011) analysed residents' perceptions of hosting the Beijing 2008 Games and found that environmental views of what were supposed to be an environmentally friendly Olympics was generally related to how favourably respondents viewed the Games. Parkes, Lettieri, and Bogle (2016) focused on the environmental issues surrounding the London 2012 Games. Their life cycle model showed that environmental impacts associated with the actual event are almost negligible compared to those associated with the whole lifecycle of the legacy phase. The results demonstrated that the highest emissions are attributed to the legacy phase (as opposed to pre-, or during event) in all scenarios.

Intellectual property

Very few articles focused on intellectual property. Of note, Xing and Chalip (2012) studied workers for the Beijing Organising Committee for the Olympic Games (BOCOG). Data showed that employees were concerned about their future capacity to use the skills they had gained at BOCOG, including their opportunities to work on matters having to do with sport. By 2008, the

workers no longer felt (as they had in 2006) that working for the event represented a passionate life filled with idealism.

Discussion

While many authors have acknowledged that legacy is complex and multi-dimensional (Girginov & Hills, 2008; Horne, 2007), few have operationalised this argument and produced empirical data to explore the multi-dimensional nature of legacy and legacy production. This is evident in the results of previous reviews (Thomson et al., 2019), which have called for greater engagement with established theoretical frameworks to comprehend legacy in more holistic terms. This study contributes to that objective by utilising a theoretically informed framework to map empirical literature. The findings build upon the current body of knowledge by identifying the extent to which event-attributed changes in structures, consequences, and stakeholders have been researched. In addition, the mapping exercise uncovered intriguing interrelationships between procedural dimensions of legacy, and provides a lens to (re)evaluate findings in light of time, space, and methodological rigour. The discussion focuses on key findings relevant to our three overarching research questions.

First, our study identified that certain event-attributed structural changes, consequences, and stakeholders have been researched extensively, while others have received limited attention. This is the case for intellectual property generation, for example (Table 5). This lack of balance is germane across all procedural dimensions of legacy, yet is particularly relevant to stakeholder perspectives and evaluations. Stakeholder theory emphasises defining and segmenting stakeholder groups based on their salience to an organisation, event, or initiative (e.g. suppliers, sponsors, employees), and clarifying how each definition informs the theoretical and empirical focus of the research (Laplume et al., 2008). However, many studies did not clearly define the stakeholder group(s) being analysed or utilised methods that cast doubt on whether perspectives were truly representative. For example, individuals as host inhabitants were by far the most studied stakeholder group, yet this research was often guided by broad definitions that obscured the diversity within this group, or relied on empirical analysis of biased data. This oversight is critical, as studies guided by more nuanced definitions and rigorous methodologies uncovered significant variation between stakeholder groups (e.g. Mackintosh et al., 2016; McGillivray, 2014). While most empirical studies will not be able to capture insight from every stakeholder group, it is important to clearly define and accurately select the groups that are under study to inform theory. This level of specificity will also help understand how event-attributed changes in structures and consequences are perceived and evaluated by different stakeholder groups.

Second, considering leading global sport organisations have recently acknowledged the importance of more holistic conceptualisations of legacy (International Olympic Committee, 2017),

Table 5. Suggested research directions assessing the relationships between event-attributed structural changes, consequences, and stakeholders.

Research direction	Exepmplary proposal	Examplary design
Consideration of neglected structural changes	Intellectual property generation is studied from the perspective of entrepreneurship	Entrepreneurs are interviewed across different sites (host cities and non-hosts) to assess differences in entrepeneurial motivation
Inclusion of particularly vulnerable stakeholders	Stakeholder groups are studied; they include individuals in need or with disadvantages (e.g. children, disabled persons)	Focus groups that disentangle expectations and evaluations in the three procedural stages are video-recorded and analysed
Consideration of processes and interrelationships	Cause-and-effect relationships are studied over time	Event hosts are contrasted with consent-based scenarios of how the host city would have developed without the event hosting
Extention of post-event timeframes	Legacy across generations is studied	Photovoice study on how quality of life of host city residents is affected even decades after the hosting is performed

future research must move beyond treating legacy as a set of mutually exclusive dimensions and instead utilise theoretical frameworks that reflect its procedural nature (Preuss, 2019). For example, sport development was a prominent area of enquiry in studies focused on the bid process, legacy plans, and public narratives leading up to sporting events (Weed, 2014), yet the consequences of event-attributed structural changes typically fell short of pre-event expectations. A closer examination of high-quality empirical studies indicated that while certain event-attributed structural changes and programmes were intended to benefit specific stakeholder groups (i.e. new participants), the consequences were actually more beneficial for others (i.e. existing participants) (e.g. Chen & Henry, 2016). In addition, several studies indicated sport participation legacies were tied to both geographic and temporal dimensions of the 'feel good factor' (Mackintosh et al., 2016), which was a prominent topic discussed in studies focused on other aspects of legacy. Process/change theories help account for the inter-dependency of event-attributed changes in structures, consequences, and stakeholder groups, yet are currently under-utilised in legacy research. We suggest it is time to incorporate more process/change theories to not only foster a deeper understanding of why and how legacies do (or do not) occur, but also consider the interrelatedness of procedural dimensions associated with different aspects of legacy.

Finally, in mapping the findings of empirical studies we noted two key methodological issues that were pervasive across the field. First, there were serious risk of bias concerns with regard to both quantitative and qualitative studies, mostly due to the lack of rigorous research designs and limited internal and external validity of findings. Relatively few studies applied explicative research designs, and many commonly used methods (e.g. survey-based research, secondary data analyses) were in part misapplied, leading to issues of interpretability. Second, legacy outcomes were examined over relatively short timeframes. Although scholars have debated what timeframe constitutes a legacy, our review showed that on average, the assessment of legacy occurred only four months after the event for primary-data based studies. We propose more research studying legacy at longer post-event intervals to provide valuable information related to the activation of legacy plans, as well as the manifestation of both negative and positive unplanned legacies. It will be imperative for research and practice to be better aligned for true evaluation of legacy. From the perspective of organising committees and hosts, legacy plans require identified legacy goals, imbedded mechanisms that can be leveraged to achieve those goals, and a realistic timeline and scale for goal achievement. As research suggests, desired legacy outcomes are unlikely to occur without supportive resources, structures, and processes in place and, therefore, these components must be intentionally developed within a legacy plan. Consequently, empirical evaluation of legacy should be undertaken in light of stated legacy goals and processes (leading to a closure report).

Limitations and outlook

This paper provided insight into selected aspects of the legacy of five sporting events: Summer and Winter Olympic Games, FIFA World Cup, UEFA Euro, and Asian Games. Despite the contributions of our analysis, we acknowledge the limitations as well. First, labels used to describe thematic categories were developed by the authors: deductively related to the three dimensions, inductively related to the categories within the three dimensions. While agreement was established between the co-authors, a different team of researchers may arrive at different categories, particularly with regard to the three dimensions (Thomson et al., 2019 identify 12 different 'legacy types'). Second, we only considered empirical studies. Thus, topics that are addressed via non-empirical procedures are under-represented or even excluded, such as those found in history, sociology, politics, arts, design, architecture, law, geography, innovation, technology, and project management. For example, architecture journals often report interviews with architects that have been involved in urban factors and engineering journals report about developments in the technology sector that

generate intellectural property (due to the use of the technology in the event). They are often non-empirical in nature.

Conclusion

The results of the present study highlight a need to more comprehensively assess legacy and legacy production. Specifically, sporting event researchers must move beyond siloed analyses of specific legacy themes to critically assess not only the multi-dimensional nature, but also the procedural nature of legacy. The length of time that legacy is assessed must be extended to years after the event to ascertain the longevity of legacies and weaknesses in legacy production over time. There remains a need to clarify and accurately assess various stakeholder groups influenced by different legacy components. The framework introduced in the present study might help to achieve these goals.

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Appendix: Coding scheme

Event-attributed changes in structures

In the open coding, we identified: 'urban;' 'environmental;' 'policy, governance, and regulation;' 'human;' 'social;' 'intellectual property' (another category was added: 'no specific structures were mentioned') (Preuss, 2015, 2019

Consequences of the changes in structures

We identified: 'economic (including tourism);' 'environmental;' 'social (including health and education);' 'political;' 'sport-related;' 'urban;' 'community-related;' 'security and surveillance-related' (Lawson, 2005; Lee, Cornwell, & Babiak, 2012; Preuss, 2015).

Stakeholder evaluations

The list of stakeholders was formed during the open coding process. The evaluations of these stakeholders may be positive, negative, or equally positive and negative (Preuss, 2007); another category labelled 'no statement possible' was added. We also coded the evaluation tools that were used in the studies: 'assessment of number of people behaving in a certain way' (e.g. tourist numbers); 'assessment of financial figures' (e.g. gross domestic product [GDP]); 'assessment of perceptions' (e.g. image survey); 'assessment of documents' (e.g. reports).

Event- and study-related factors

We identified: type of sporting event (what?), time (when and for how long?), and location (where?). We also reported the research goals and the design of the empirical studies, and their methods (participants and their characteristics [number, gender, mean age] and the sampling strategy).

Inter-coder reliability

First, we developed a coding sheet and manual, along with a systematic coding procedure. Second, five authors took part in a coding training exercise to familiarise themselves with the coding sheet and manual, and ensure they were implementing the coding schemes consistently. Third, each of the five authors independently coded six studies that differed in goal and study design (not part of the actual systematic review), then discussed and compared their coding approach. Fourth, throughout the process, regular meetings of the team were held to discuss the process. Inter-rater agreement was calculated to ensure the reliability of the coding (Hayes & Krippendorff, 2007; Krippendorff, 2004). The analysis revealed a Krippendorff's alpha of .82, an acceptable level (i.e. above .80).