Assessing the long-term inspirational impact of sporting-mega-events on sport and physical activity participation: postevents' evidence from the UK and China

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Executive Summary

The aim of our research was to assess long-term inspirational effect of sporting mega-events on sport and physical activity (PA) participation, focusing on the cases of the Beijing 2008 Olympic Games and the London 2012 Olympic Games. We reported a significant increase in regular active sport and PA participation by the host city residents for several years after the Olympics (for 12 years in Beijing and 8 years in London). Nearly half of respondents believed that the hosting of the Olympics had inspired them to increase their sport/PA participation and/or to try a new sport/PA (46% for Beijing, 47% for London). We found no significant differences between men's and women's long-term sport participation behaviour and perspectives on inspirational effects. However, compared with London, Beijing residents were ostensibly more positive about the inspirational effects of the Olympic Games, which can perhaps be explained by sociocultural contextual differences between the two cases. We found that, from the list of factors that potentially facilitated or inhibited sporting-mega-event-inspired behavioural changes, time, sport attitude, sport facility accessibility, sport competence, and sport confidence were significantly associated with behavioural changes. Sporting-mega-event-inspired behavioural changes might be increased by offering legacy programmes that support buddy participation for trying a new sport/PA. Marketing to promote participation and clear signposting of locations where people can participate in sports would also be helpful.

'I remember clearly… at the 2008 Olympics, Zhang Juanjuan, a Chinese women's archery team member, competed with the South Korean team in the final and won the first gold medal in the women's individual archery competition for China. It actually had a big impact on me… and, yes, at that moment, I decided to learn archery.'

– A Beijing Resident

Background and rationale

The right to host a sporting mega-event usually comes with a high price tag. Politicians tend to justify such hefty costs with the argument that sporting mega-events promote widespread sport and physical activity (PA)

However, despite the popularity of this theory, two systematic reviews (McCartney et al., 2010; Weed et al., 2015) have yielded little robust evidence that sporting mega-events increase sport and PA participation among members of the general public. Furthermore, the long-term inspirational effects of sporting mega-events have yet to be demonstrated.

We, therefore, conducted a rigorous post-Games evaluation of the long-term inspirational effects exerted by the London 2012 Olympics and the Beijing 2008 Olympics on residents' sport and PA participation behaviours.

Specifically, this project asked the following questions:

1. Have the London 2012 Olympics and the Beijing 2008 Olympics inspired people to participate in more or less sport and PA?
2. What factors are there, if any, that encourage or hinder people in being inspired by the two sporting-mega-events to change their PA behaviours?

Literature review

The positive impacts of sport events on nations' recreational sport and physical activity participation (Toohey, 2010, p. 2772) have been described as 'inspirational effects' (Ramchandani & Coleman, 2012), 'trickle-down effects' (Hindson, Gidlow, and Peebles, 1994), or 'demonstration effects' (Weed, 2009) – meaning "a process by which people are inspired by elite sport, sports people, or sports events to participate themselves." (Weed, 2009, p. 4).

Two terms, 'inspirational' and 'motivational', were used in this study to capture two types of behaviour changes: 'The inspiration of inactive individuals to participate more in sport' (Potwarka et al., 2018) and 'the motivation of active sport participants to participate more frequently or to engage with other types of sports' (Wicker et al., 2017). One route to successful inspiration is termed the *festival effect* (Weed et al., 2012), describing the effect that events can generate in communities where residents gain a more positive perception of an event after engaging with festival activities (Watt, 2003). This festival effect potentially generates participation interest (Brown & Massey, 2001; Reis et al., 2017).

Theoretically, self-efficacy theory, the transtheoretical model (TTM[1]), planned behaviour, and self-determination theory are cited in the literature to explain the inspiration process. In particular, the transtheoretical model has been widely used to understand exercise and physical activity (PA) behaviour (Han et al., 2017). The TTM model examines how individuals' behaviours can change and suggests that people dynamically move through five different stages of behavioural changes (Prochaska and DiClemente, 1983), namely, precontemplation, contemplation, preparation, action, and maintenance. The following five different stages of behavioural changes have been adapted by later studies for the context of exercise and PA (Lee et al., 2006; Liu et al., 2018; Nigg, 2002; Schumann et al., 2002): precontemplation (not intending to make changes or denying the need for change), contemplation (seriously considering making changes), preparation (making small changes in preparation for physical activity), action (active engagement in exercise), and maintenance (regular exercise for a sustained period of time). Importantly, research suggests that the Olympics, together with other factors, plays an important role in helping individuals move along the TTM continuum (Ramchandani, Coleman, and Christy, 2017).

Although the skills and abilities of athletes and the quality of a sporting competition might serve as inspiration, a perceived competence gap may deter participation (Hindson et al., 1994). A

[1] The four core constructs of TTM are stages of change, self-efficacy, decisional balance, and processes of change.

discouragement effect does indeed exist (Vanden Heuvel & Conolly, 2001) if individuals feel that such elite levels of performance are impossible to reach after watching athletes (Potwarka, 2015).

The sport participation impacts of major sporting events have attracted substantial research interest in the past 20 years (Thomson et al., 2019), the literature yet to reach conclusive findings to support the assumption that host nations' sport participation levels increase after major sporting events (McCartney et al., 2010; Mahtani et al., 2013; Weed et al., 2015). Most studies have found no evidence of long-term sustainable sport participation impacts from the Games (Annear, Shimizu, Kidokoro, 2019).

Some studies support the notion of an inspirational effect. For example, a short-term positive sport participation legacy was reported from the London 2012 Olympic Games (Kokolakakis, Lera-Lopez, & Ramchandani, 2019) whereby moderately active participants demonstrated significant increases in sport participation, particularly in certain sociodemographic groups (top occupations, ethnic minorities, people aged 55–74 years, and homeowners). This echoes the findings of other studies that also found London 2012 Olympics significantly increased sport participation (Chen & Henry, 2016). Similarly, positive short-term participation impacts were observed after the Lillehammer 1994 Games, the Sydney 2000 Games (Cashman, 2006), the Athens 2004 Games (Pappous, 2011), and the Vancouver 2010 Games (Potwarka & Leatherdale, 2016).

Other studies have reported decreased participation (in some measurement after for example the Sydney 2000 Games Veal, 2003); for the same events, some studies reported no Games-related changes in physical activity participation among Australian adults (Bauman, Bellew, & Craig, 2014). Researchers are beginning to question the quality of the evidence and call for more research to unpack the inspirational process and its pragmatic influence (Gratton & Taylor, 2000).

Part of the inconclusiveness of the findings might be attributable to the difficulty involved in measuring sport participation impacts (Wicker & Sotiriadou, 2013) and a lack of agreement on the research approaches that should be used for measurement (Bauman et al., 2015; Veal et al., 2012). Many studies have adopted quantitative approaches for assessing sport participation changes. However, the cross-sections of data used for analysis have varied in size (sf. Ramchandani & Coleman, 2012; Zhou et al., 2018), and various logistic regression models have been applied to estimate the trickle-down effect (e.g., Craig & Bauman, 2014; Wicker & Sotiriadou, 2013).

Some studies have employed qualitative methods to examine sport participation legacy (Carter & Lorenc, 2013; Feng & Hong, 2013; Mackintosh et al., 2016; Wicker & Sotiriadou, 2014), which has seemed to yield a substantial number of theoretical interpretations of inspirational effects. Overall, rigorous research evidence on the topic continues to be lacking (Weed et al., 2015), particularly on the long-term sport participation impact of events. The research designs used are relatively conservative; triangulation approaches (Chen & Henry, 2016), longitudinal studies (Potwarka & Leatherdale, 2016), and cohort studies (Annear et al., 2019) have been used relatively infrequently.

Moreover, it is difficult to isolate the impacts of the Games from those of other factors (Chen & Henry, 2016; Ramchandani et al., 2015; Veal et al., 2012). Scholars have warned that the lack of understanding regarding the interactions between events and participants (Coalter, 2004) and the complexity of the causal links between the events and changes in sport participation (Chen & Henry, 2016) render the attributable impacts of the Games difficult to measure (Weed et al., 2015). Host countries also offer different participation leveraging strategies (McCartney et al., 2010), and the sport policy, systems, and provision vary among host countries, exerting direct impacts on how participation engagement is accommodated and facilitated after the Games (Feng & Hong, 2013).

The various factors that influence participation, both in terms of facilitators and barriers, can be described as intrinsic and extrinsic. The literature mentions numerous intrinsic factors, which are directly related to individuals' circumstances, that affect sport participation: One's perceived confidence and competence in relation to sport (Belanger et al., 2011; Eberline et al., 2018), health status (Dlugonski et al., 2011), domestic responsibilities (Scheerder & Vos, 2011), time availability (Palacios-Ceña et al., 2012), sociodemographic status (Cerin & Leslie, 2008), age (Downward, Lera-Lopez, & Rasciute, 2011), gender (Van Tuyckom, Scheerder, & Bracke, 2010), and health awareness (Chen & Henry, 2016).

Extrinsic factors identified in the literature that are indirectly related to personal circumstances include accessibility to facilities (Wicker, Hallmann, & Breuer, 2013) and sports opportunities (Kars et al., 2009), costs (Pittet et al., 2009), sports environment (Sallis et al., 2006), (such as culture and facilities), social pressure (Wilcox et al., 2002), peer support and other socioecological factors (Devís-Devís et al., 2015), live event experience (Teare et al., 2021), and Games legacy programmes and facilities (Aizawa et al., 2018; Bauman, Murphy, & Matsudo., 2013; Chen & Henry, 2016).

Evidence of sustained long-term effects by major events on sport participation behaviour is also limited (Engalycheva & Chappelet, 2015), particularly considering the difficulty associated with measuring the long-term impact of the Games (Aizawa et al., 2018). A few studies have attempted to examine this topic. For example, using qualitative approaches, Feng and Hong (2013) reported no long-term positive sport participation impacts in China's nonhosting regions after the 2008 Games. When analysing Japanese National Sport-Life surveys of the past 20 years, Aizawa et al. (2018) found that people who experienced the Tokyo 1964 Olympics participated in sport more frequently than did people from other generations. In another study examining the long-term impacts on grassroots sport participation as a result of the Beijing Games, 140 residents were interviewed in six townships in China, and any sport participation impact was revealed to last only for the duration of the Games and to not be sustained beyond three years after the Games finished in 2011 (Feng & Hong, 2013).

Overall, despite increasing examination of sport participation impacts, empirical evidence remains limited (Wicker and Sotiriadou, 2013; Kokolakakis et al., 2019) and poor quality (Hanstad & Skille, 2010; Weed et al., 2012). However, this is not to refute the ability of sporting events to inspire sport or PA participation (Weed et al., 2015). We aimed for our research to contribute to a rigorous examination of the respective events' long-term impacts on sport and PA participation.

Methods

Due to the complexity of assessing sporting-mega-event impact (Henry, 2016), the research project is grounded in three sets of theoretical approaches, as follows:

1) **Theory of Change evaluation**: Theory of change evaluation approach (Mayne, 2001) has recently been accepted as a foundation for most types of impact evaluation (Todd, et al., 2013). Surprisingly the application of such an approach has been scarce in the field of sport (Chen & Henry, 2020). Central to the theory of change approach is the importance of determination of causation, process tracing, and contextual awareness. These features, in turn, help to overcome one of this project's limitations (i.e. lack of baseline data). Thus, by incorporating such an innovative approach, this study will identify the causal mechanisms have worked in generating changes.

2) **Prochaska et al.'s (1992) transtheoretical model** is selected for analysing the inspirational effect of the two Olympics on changing sport and PA behaviour. This is because that the validity and popularity of the model are regarded as the highest (Weed, et al., 2015) among the four main theories of behaviour change in sport and exercise literature (Forster, et al., 2005). The model will be incorporated into the questionnaire to identity intentional changes from '*no intention of becoming physically active*', '*thinking about becoming physically active*', '*making small changes in sport and PA behaviour*', and '*meeting a criterion of physically active, but only recently*', to '*meeting a criterion of physically active for a sustained period of time*'.

3) Particularly to focus on individuals' intention to change PA behaviour immediate after the Olympics. To do so, we incorporated **implementation intentions theory** (Gollwitzer, 1999) into the preparation stage of behaviour investigation, that is to detect whether efforts were made to accelerate the initiation of relevant actions, by specifically formulating plans detailing where and when to get started, and with whom.

This assumption translated into the context of the Olympic hosting, in terms of individuals' sport and PA intention and behaviour changes as influenced by the Olympics, constituted the following Yes/No questions: 1) the Games had made me think about becoming more physically active immediately after the Games (precontemplation); 2) the Games had made me think about becoming more physically active immediately after the Games; but in reality I didn't participated more in PA (contemplation). 3) although I didn't participated more in PA after the games, the Games had made me think about becoming more physically active and I had made plans (when, where and/or who to play sport) about it (preparation); and 4) The games have had inspired me to participate more in sport (Action).

We adopted a mixed-method case study design focusing on London and Beijing. After a scoping review of the literature, the first stage of the study was semi-structured, using a combination of purposive and convenient sampling strategies. In-person interviews were conducted with residents in London (n = 7) and telephone interviews with residents in Beijing (n = 8) at the end of 2019. Interviews lasted between 60 and 90 minutes. Interviews were terminated as repetitive comments surfaced from the data. Thematic analysis was used for qualitative data analysis.

Insights gathered from those interviews were fed into the second phase of the study, in which a cross-sectional survey design was used to assess changes in sport and PA over time and to explore whether the Games triggered any of the changes observed for both host cities. After piloting, self-administrative surveys were distributed in Beijing in January 2020, with 429 responses returned. After data clearing, 399 surveys were yielded. Due to the outbreak of COVID in March 2020, London data collection was postponed. After receiving permission from the British Academy, online surveys subsequently adopted (223 surveys were returned, of which 168 were usable) between September 2020 and January 2021. IBM SPSS software was used for survey analysis, and both descriptive and inferential analysis were performed.

Findings

6.1 Results

A summary of the statistics for primary variables in London and Beijing are shown in Table 1. The two case cities share a similar demographic distribution: There was a relatively even split between men and women; over 60% of the sample comprised young people (18–25 years of age); more than half of participants both samples reported being in good health, having single status, and being educated to a relatively high level; and around 80% worked in non-sport-related jobs.

More than 67% of the Beijing survey respondents worked full-time, while half of the respondents in London were students. Over 60% of London respondents had watched the Olympic Games onsite, compared with 35% of Beijing respondents.

Table 1. Description of independent variables and summary statistics

Variable	Description	Locations	Mean	Frequency	SD
Games viewers (TV, social media etc.)	1 = Yes 2 = No	Beijing	1.04	1: 384; 96.2% 2: 15; 3.8%	0.190
		London	1.03	1: 139; 97.2% 2: 4; 2.8%	0.165
Live Games spectators	1 = Yes 2 = No	Beijing	1.64	1: 143; 35.8% 2:256; 64.2%	0.480
		London	1.36	1: 92; 64.3% 2: 51; 35.7%	0.481
Physical disability or long-term health	1 = Yes 2 = No	Beijing	1.88	1: 49; 12.3% 2: 350; 87.7%	0.329
		London	1.96	1: 6; 4.2% 2: 137; 95.8%	0.201
Health condition	1 = Poor 2 = Fair 3 = Good 4 = Very Good 5 = Excellent	Beijing	3.04	1: 2; 0.5% 2: 119, 29.8% 3: 175; 43.9% 4: 68; 17% 5: 35; 8.8%	0.917
		London	3.67	1: 1; 7% 2: 18; 12.6% 3: 45; 31.5% 4: 42; 29.4% 5: 37; 25.9%	1.091

Age	1=18-25 2=26-33 3=34-42 4=43-52 5= 53-62 6=63-72 7=73+	Beijing	2.25	1: 156; 63.6% 2: 103; 11.2% 3: 59; 9.1% 4: 51; 4.9% 5: 26; 9.1% 6: 2; 0.5% 7: 2; 0.5%	1.335
		London	1.91	1: 91; 63.6% 2: 16; 11.2% 3: 13; 9.1% 4: 7; 4.9% 5:13; 9.1% 6: 3; 2.1%	1.443
Gender	1=Males 2=Females	Beijing	1.41	1: 235; 58.9% 2: 164; 41.1%	0.493
		London	1.58	1: 60; 42% 2: 83; 58%	0.495
Ethnic	1 = Han 2 = Non- Han	Beijing		1: 373; 93.5% 2: 26; 6.5%	
	1 = Asian or Asian British – Indian; 2 = Asian or Asian British – Pakistani; 3 = Chinese; 4 = Mixed-white and Asian; 5= Mixed – White and Black Caribbean; 6= White- British; 7 = White-Irish; 8 = Other; 9 = Do not wish to disclose	London		1: 7; 4.9% 2: 1; 0.7% 3: 19; 13.3% 4: 4; 2.8% 5: 1; 0.7% 6: 96; 67.1% 7: 1; 0.7% 8: 12; 8.4% 9: 2; 1.4%	
Employment status	1= Student； 2= Full-time；3= Part-time； 4= Looking after family/home； 5= Retired；	Beijing	2.05	1: 83; 20.8% 2: 269; 67.4% 3: 16; 4.0% 4: 7; 1.8% 5: 24; 6%	0.927
		London	1.67	1: 73; 51% 2: 53; 37.1% 3: 9; 6.3% 4: 7; 4.9% 5: 1; 0.7%	0.854
Occupation	1= Sport-related job； 2= Non-sport-related job	Beijing	1.80	1: 80; 20.1% 2: 319; 79.9%	0.401
		London	1.81	1: 27; 18.9% 2:116; 81.1%	0.393
Marital status	1= Single 2= Married or have a partner 3= Other	Beijing	1.78	1: 87; 60.8% 2: 50; 35% 3: 3; 2.1% 4: 3; 2.1%	0.722

	4= Do not wish to disclose	London	1.45	1: 87; 60.8% 2: 50; 35% 3: 3; 2.1% 4: 3; 2.1%	0.647
Education levels	1=Other qualifications at level 1 and below 2=GCSE (A*-C) 3= A levels, vocational level 3 & equivalents 4=Vocational equivalents level 4 & equivalent 5=Bachelor's degree; 6=Master's degree	Beijing	4.96	1: 3; 0.8% 2: 7; 1.8% 3: 23; 5.8% 4: 76; 19% 5: 149; 37.3 6:141; 35.3	1.027
	1= Higher Education degree & professional/vocational equivalents; 2= Higher Education below degree level;3= A levels, vocational level 3 & equivalents; 4= GCSE/O Level grade (less than 5 A*-C), other qualifications at level 1 and below	London	1.41	1: 105; 73.4% 2: 22; 15.4% 3: 15; 10.5% 4: 1; 0.7%	0.816
Length of residence	1： ≥ 11 years 2： < 11 years	Beijing	1.34	1: 264; 66.2% 2: 135; 33.8%	0.474
	1： ≥ 8 years 2： < 8 years	London	1.40	1: 35; 60.3% 2: 23; 39.7%	0.493

6.2 Participation data

Our survey results showed that, in both Beijing and London, adult participation in sport and PA had exhibited a statistically significant increase, at the time of the survey, compared with before the Games. The following participation rates were recorded (see Figure 1):

- **Beijing**: A significant increase occurred in sport and PA participation frequency after the Games (mean [M] = 5.39, standard deviation [SD] = .179; $t[398] = -4.49$; $p < .000$) compared with before the Games (M = 4.57, SD = .194). The eta-squared statistic (.05) indicated a small effect size.
- **London**: A significant increase occurred in sport and PA participation frequency after the Games (M = 3.94, SD = .118; $t[135] = -4.77$; $p < .000$) compared with before the Games (M = 3.37, SD = .121). The eta-squared statistic (.06) indicated a moderate effect size.

Figure 1. Weekly participation level in sport and PA before and after the Games.

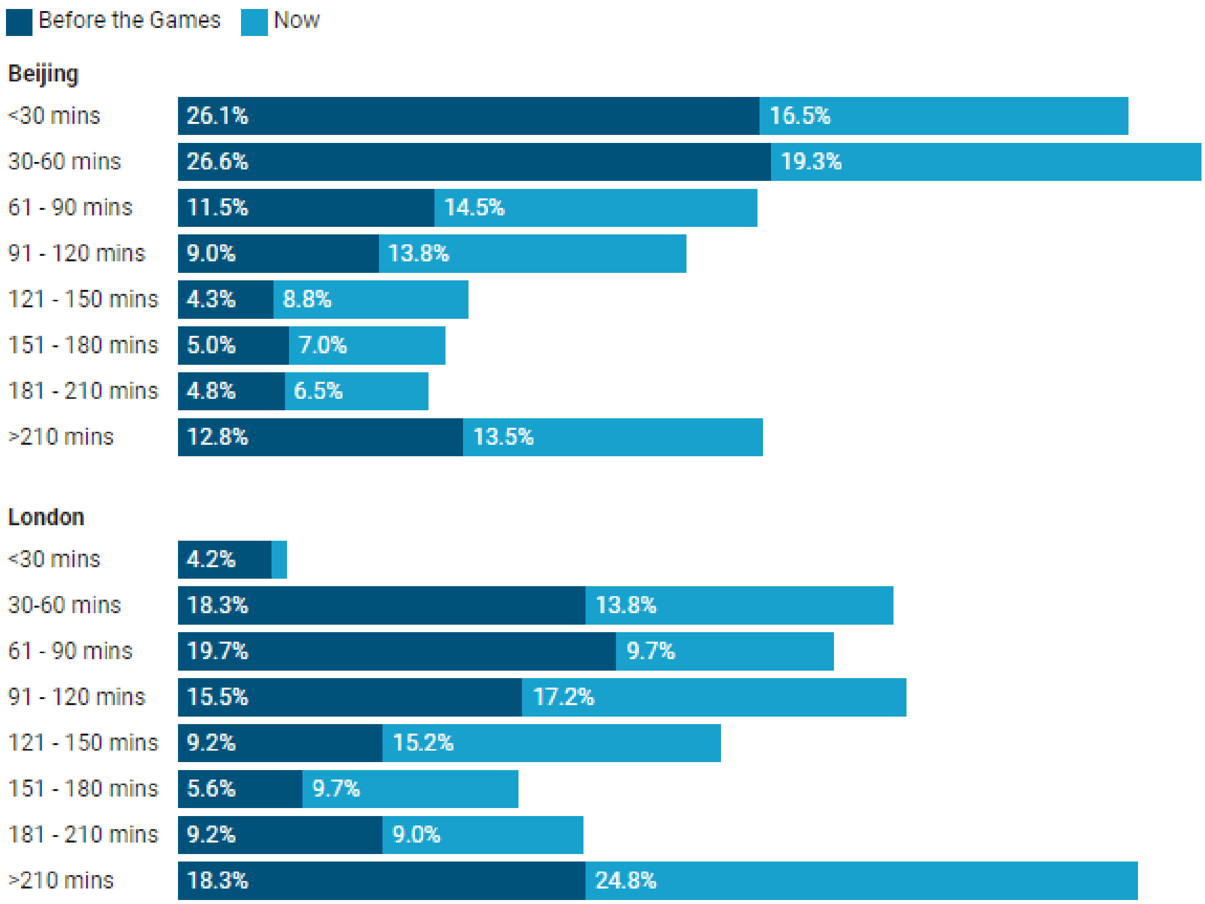
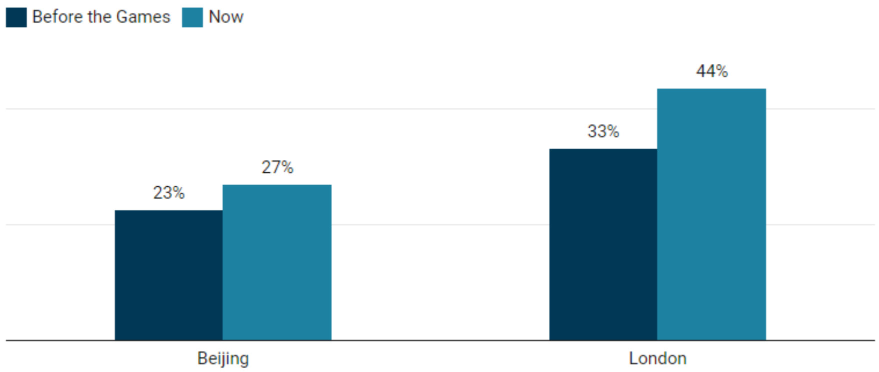


Figure 2 displays a further breakdown of the moderate intensity measures. It shows the change of sport participation levels amongst 'active sport participants' – those participating more frequently on a regular basis (at least 150 mins a week) before and after the Games: London had an 11% increase in the proportion of active sport participants after the Olympics; Beijing had only a 4% increase.

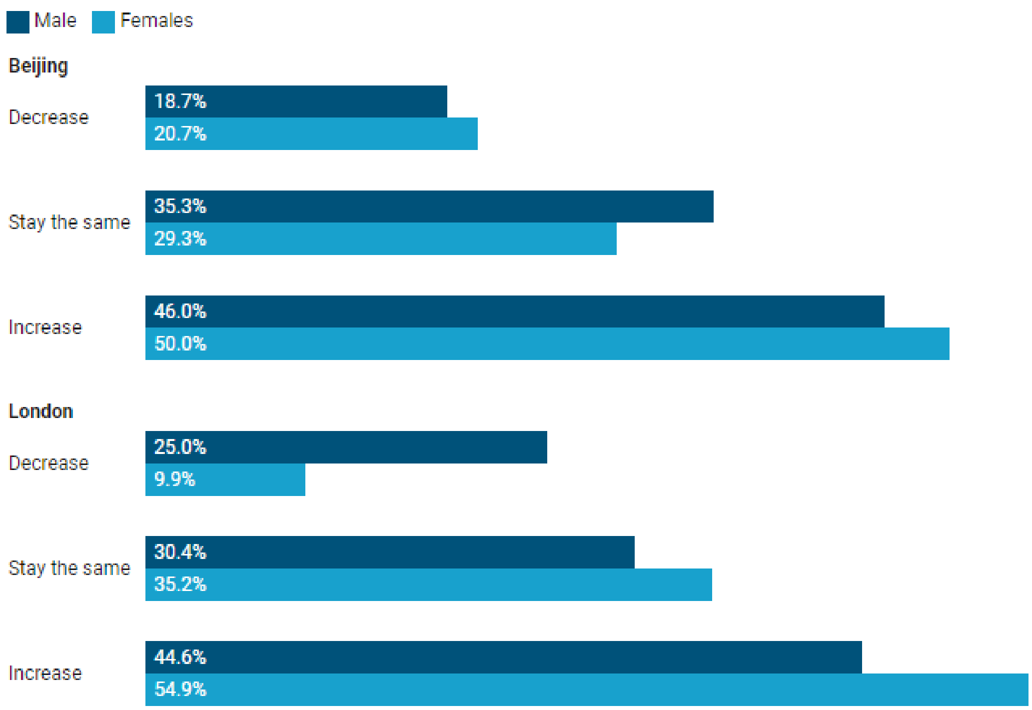
Figure 2. Weekly sport and PA participation level before and after the Games, amongst those 'sport active participants' (at least 150 mins a week).



In both cities, no statistically significant differences were noted in the numbers of male versus female study participants whose sport participation increased, remained unchanged, or decreased after the Games compared with before (see Figure 3). However, before- and after-Games sport participation increased slightly more for women than for men (Beijing: 4%; London: 10.3%).

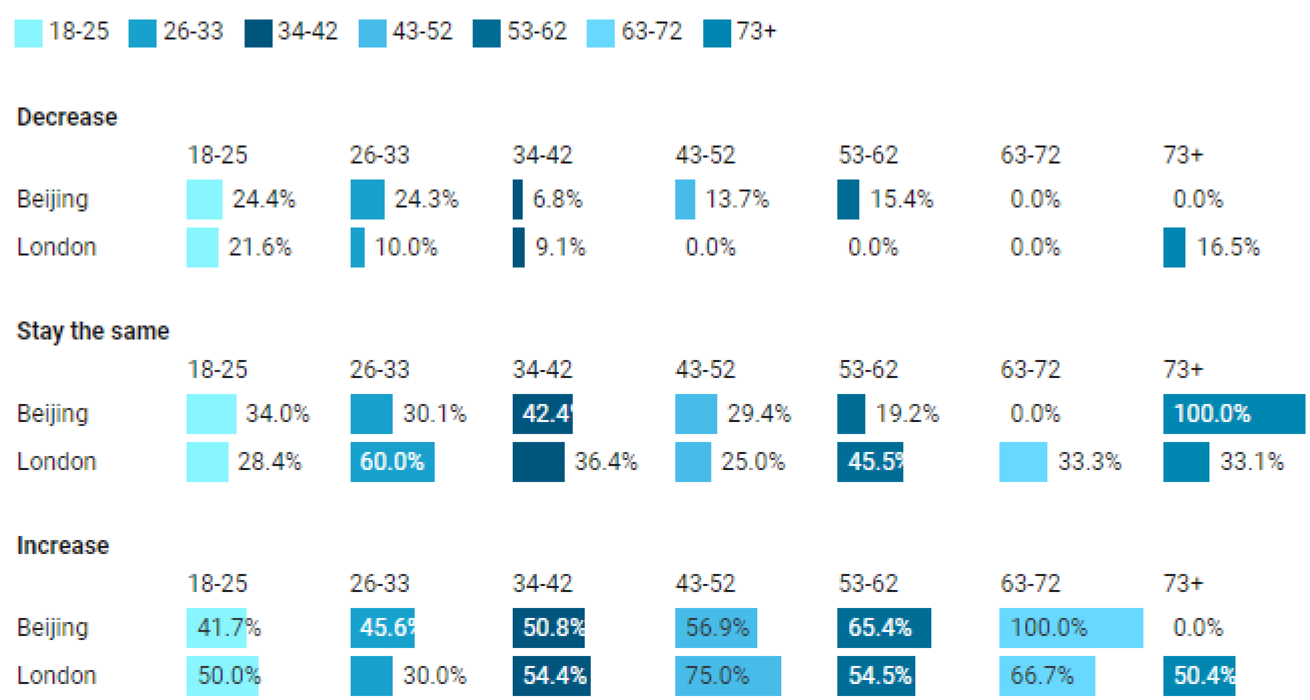
No significant differences were reported between London and Beijing's other demographic variables, including age, ethnicity, marital status, parental status, occupation, or education.

Figure 3. Changes in sport participation level between men and women before and after the Games



Interestingly, for Beijing, a correlation was noted between participation and age, and participation rates increased as age increased (see Figure 4). However, the sample size of the subgroup for age 63+ years was relatively small, so this may not have been representative of the population.

Figure 4. Changes in sport participation level between different age groups before and after the Games.

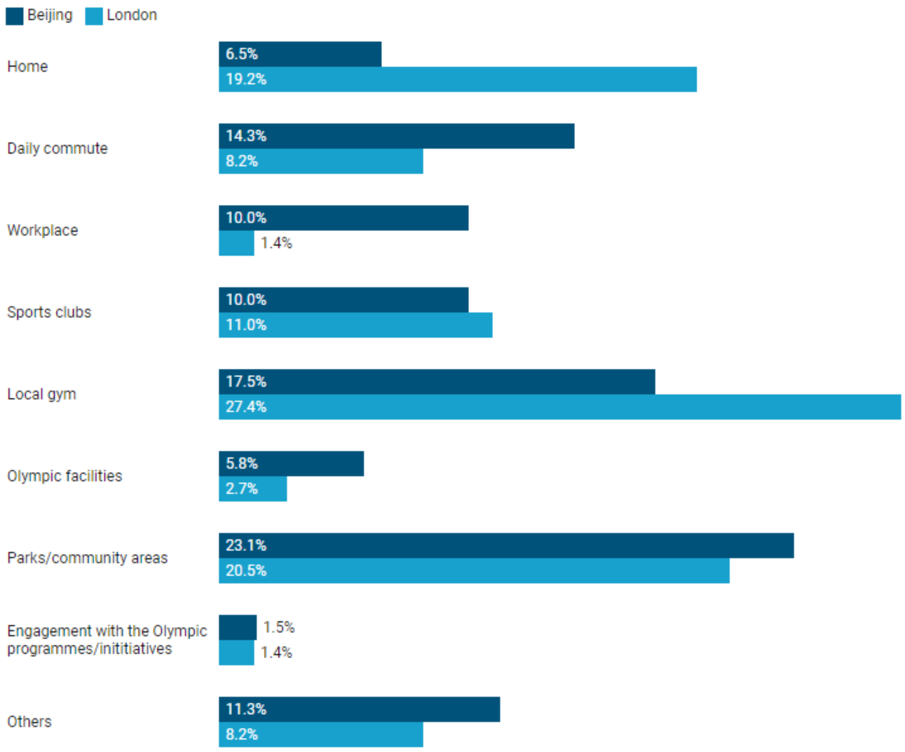


When we surveyed the places where people regularly participated in sport and PA, respondents in both case cities reported that they seldom used Olympic facilities and engaged minimally with the Olympic programmes/initiatives (see Figure 5); the places they used most for sport and PA participation were parks/community areas (Beijing = 23.1%) and local gyms (London = 27.4%).

‘The legacy of the Games [influenced my participation behaviour] … a lot to do with what's happening since the Games, because it's not just one thing that happened a few years ago, … It's sort of continuing … There's always stuff going on around the [Olympic] park. It’s quite hard to kind of not get involved, in a way, and to not be motivated by what's happening around [you].’

– A London Resident.

Figure 5. Locations where most sport and PA participation took place.



6.3 Inspirational effects

Routes of Inspiration

Traditionally, studies relating to the inspirational effects of sporting events have tended to treat ‘inspiration’ as a general term in the context of these events. However, sporadic reports have detailed the specific manner in which sporting events inspire greater sport participation among members of the general public. We refer to these specific forms or types of inspiration as '*routes of inspiration*', and this study represents the first attempt to distinguish between them.

We used our literature review and interview results to summarise three such routes, which were relevant to the contexts of Beijing and London, representing the effects of sporting event hosting: [1] Watching elite sport performances (the so-called trickle-down effect or role model effect) inspires people to participate in sport (Weed, 2009; Wicker & Frick, 2016); [2] the Games in general – including the atmosphere and the promotion of Olympic values and sportsmanship – and the resulting publicity for the health-related benefits of sport participation potentially influences participation behaviours (Chen & Henry, 2020; McCartney et al., 2014); and [3] the building of event facilities improves access to sport (Veal, Toohey, & Frawley, 2012), and Games legacy programmes enhance sport participation opportunities (Chen & Henry, 2016).

'The inspirational impact of the Games on me came not just from watching elite athletes perform and compete; it came from the Games as a whole… The Games has more [to it], such as sportsmanship, which was highlighted in those after-match interviews – you know, when they tell you their personal stories behind the scenes. I felt very moved and inspired.'

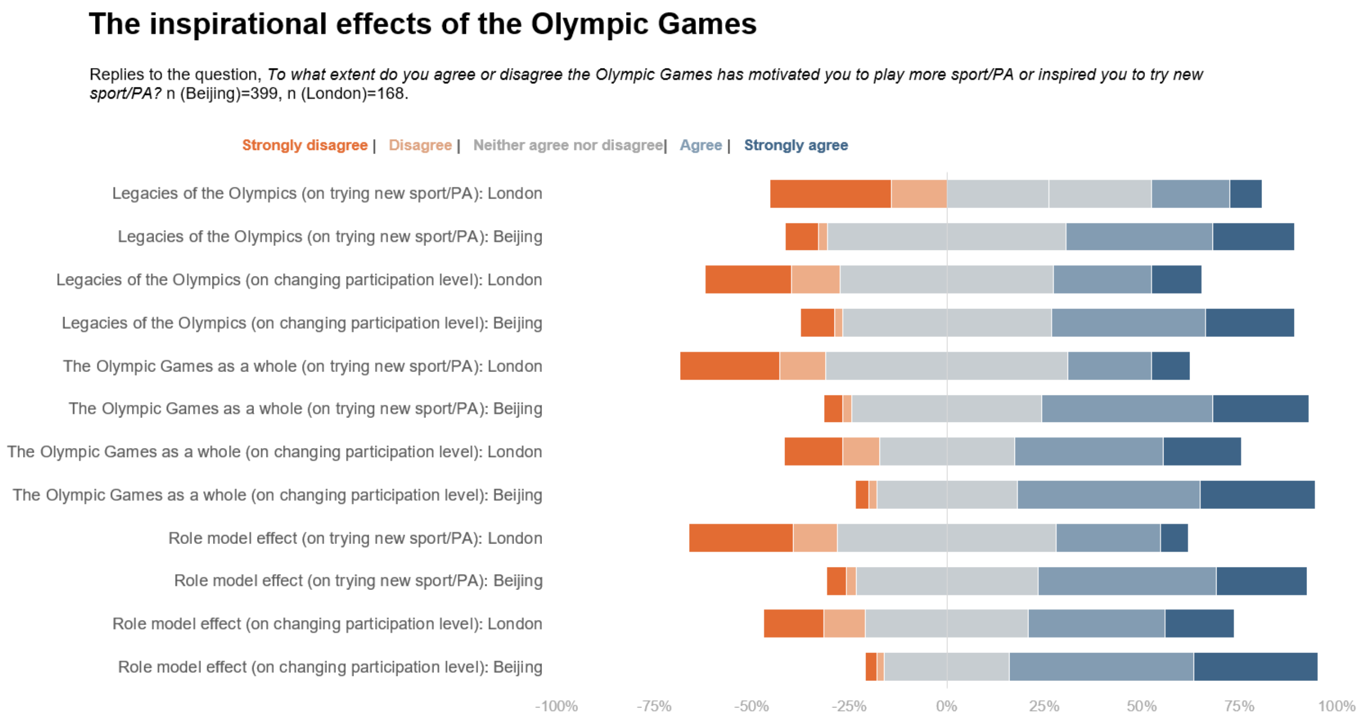
– A Beijing Resident

We subsequently surveyed Beijing and London residents regarding the perceived influence of the aforementioned three routes of inspiration: [1] elite-athlete-role-model/trickle-down effects, [2] the Games as a whole (including its atmosphere and the promotion of health-related benefits from sport participation), and [3] the Games' legacies (facilities and programmes). Beijing residents considered that [1] elite-athlete-role-model/trickle-down effects were more effective (74%) for triggering changes in participation behaviour (increasing participation and encouraging people to try new sports) compared with other routes of inspiration (73% and 61% for routes [2] and [3], respectively). By contrast, London residents reported that [2] the Games as a whole was more effective (45%) for triggering participation changes than were the other routes of inspiration (44% and 33% for routes [1] and [3], respectively). Figure 6 illustrates this in more detail.

'To be honest, I didn't pick up [new] sport or physical activity immediately after the London 2012 Games. But..I would say that I'm inspired to participate more [in the sports/PA I regularly do] by the legacies of the Games.'

– A London Resident

Figure 6. Perceptions of the inspirational effects of the Games (Beijing and London).



In general, Beijing residents perceived that the Olympic Games had positive motivational impacts on sport participation engagement and willingness to try new sports (through all three routes of inspiration, with a mean of 69% of survey respondents stating that they either agreed or strongly agreed that the Olympics exerted inspirational effects). Respondents in London perceived this effect to a lesser extent (40%).

> ***'I feel that the Olympic Games in London was a massive, massive part of the country. And so a lot of young people, including me, were inspired by that. There were lots of clubs and charities and things, and that was set off because of the Games.'***
>
> ***– A London Resident***

Inspirational outcomes

Having understood the inspirational effects of the Games on host residents' perceptions of sport and PA participation, we proceeded to examine the links between inspirational effects and actual behaviour changes. Other research has indicated two types of inspirational outcomes in the context of major sporting events: (1) increased sport participation levels (Potwarka, 2015) and/or (2) uptake of new sports and PA (Rammadiche, 2013).

We compared the perceptions of these two outcomes among survey respondents. We found that residents in both cities were more likely to feel that the Olympics had increased their participation in sport and PA (an average of 73% of respondents in Beijing and 50% of respondents in London either agreed or strongly agreed that this was the case) than they were to feel that the Olympics had inspired them to try new sports (65% for Beijing and 31% for London).

ANOVA analyses were run to check whether host residents from three participation groups – categorised according to whether their participation increased, decreased, or remained unchanged participation at the time of the study compared with before the Games – differed in their perceptions of the Games' inspirational effects. We obtained the following results for the three routes of inspiration examined in our case cities:

Beijing

[1] <u>Elite-athlete-role-model/trickle-down effects</u>:

- For **increased sport participation levels**: A statistically significant difference was noted at the $p < .05$ level in the inspirational scores for the three participation groups:

Welch's F (2, 182.18) = 4.15; p = .017. The effect size calculated using an adjusted omega squared formula was small (ω^2 = .015).

$$est.\,\omega^2 = \frac{df_{bet}(F-1)}{df_{bet}(F-1)+N_T}$$

The difference was significant for Increase vs. No change [(mean difference = .285; p (.013) < α (.05)].

- For **uptake of new sports and PA**: A statistically significant difference was noted at the p < .05 level in the inspirational scores for the three participation groups: Welch's F (2, 185.07) = 3.62; p = .029. The effect size calculated using an adjusted omega squared formula was small (ω^2 = .012).

  The difference was significant for Increase vs. No change (mean difference = .266; p = .035).

[2] <u>The Games' atmosphere and promotion of health-related benefits from sport participation</u>:

- For **increased sport participation levels**: A statistically significant difference was noted at the p < .05 level in the inspirational scores for the three participation groups: Welch's F (2, 185.43) = 4.26; p = .015. The effect size calculated using an adjusted omega squared formula was small (ω^2 = .016).

  The difference was significant for Increase vs. Decrease (mean difference = .328; p =.023)

- For **uptake of new sports and PA**: A statistically significant difference was noted at the p < .05 level in the inspirational scores for the three participation groups: Welch's F (2, 188.19) = 5.66; p = .004. The effect size calculated using an adjusted omega squared formula was small (ω^2 = .023).

  The difference was significant for Increase vs. Decrease (mean difference = .315; p = .041)
  The difference was significant for Increase vs. No change (mean difference = .308; p = .12)

[3] <u>The Games' legacies (facilities and programmes):</u>

- For **increased sport participation levels**: No statistically significant difference was noted between groups

- For **uptake of new sports and PA**: No statistically significant difference was noted between groups.

London

[1] Elite-athlete-role-model/trickle-down effects:

- For **increased sport participation levels**: No statistically significant difference was noted between groups
- For **uptake of new sports and PA**: No statistically significant difference was noted between groups.

[2] The Games' atmosphere/promotion of health-related benefits from sport participation:

- For **increased sport participation levels**: No statistically significant difference was noted between groups
- For **uptake of new sports and PA**: No statistically significant difference was noted between groups.

[3] The Games' legacies (facilities and programmes):

- For **increased sport participation levels**: No statistically significant difference was noted between groups
- For **uptake of new sports and PA**: No statistically significant difference was noted between groups.

Table 2. Means and standard deviations of inspirational effects scores by actual participation level changes before the Games and present.

		Beijing			London		
		N	Mean	Std. Deviation	N	Mean	Std. Deviation
Route [1]: Changing participation level	Decrease	78	4.03	.980	22	3.41	1.054
	No Change	131	3.88	.961	48	3.35	1.313
	Increase	190	4.16	.749	66	3.65	1.030
	Total	399	4.04	.877	136	3.51	1.142
Route [1]: Trying new sport	Decrease	78	3.74	1.012	22	2.82	1.053
	No Change	131	3.69	1.016	48	2.92	1.048
	Increase	190	3.95	.812	66	3.17	1.032
	Total	399	3.82	.929	136	3.02	1.043
Route [2]: Changing participation level	Decrease	78	3.78	.962	22	3.73	1.120
	No Change	131	3.92	.982	48	3.27	1.349

	Increase	190	4.11	.779	66	3.67	1.043
	Total	399	3.98	.894	136	3.54	1.180
Route [2]: Trying new sport	Decrease	78	3.68	1.000	22	2.77	1.110
	No Change	131	3.69	1.001	48	2.90	1.189
	Increase	190	3.99	.839	66	3.15	0.980
	Total	399	3.83	.937	136	3.00	1.082
Route [3]: Changing participation level	Decrease	78	3.54	1.002	22	3.05	1.214
	No Change	131	3.69	1.014	48	3.04	1.271
	Increase	190	3.82	.931	66	3.27	1.046
	Total	399	3.72	.977	136	3.15	1.154
Route [3]: Trying new sport	Decrease	78	3.49	.936	22	2.73	.985
	No Change	131	3.64	1.023	48	2.79	1.184
	Increase	190	3.76	.951	66	2.91	1.048
	Total	399	3.67	.975	136	2.84	1.083

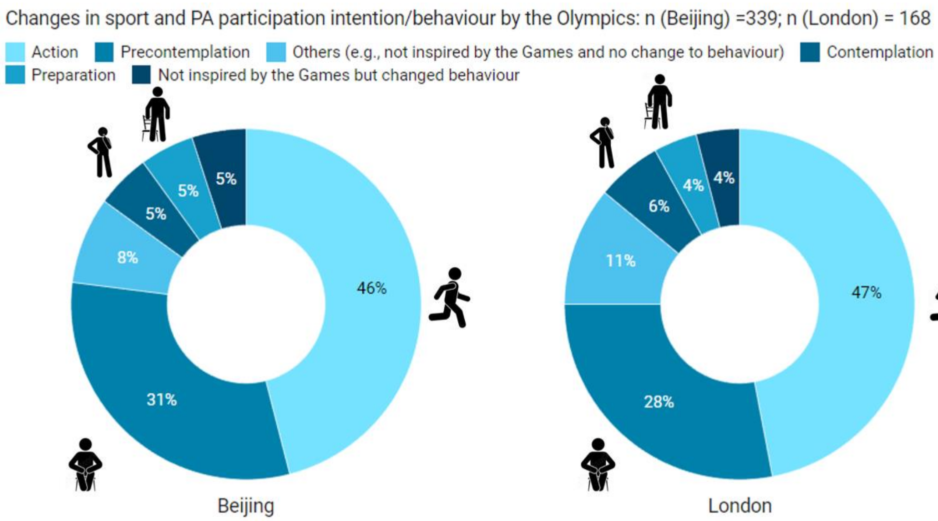
6.3 The stages of change model

This research focused on sport and PA participation behaviour changes inspired by the hosting of the Olympics, but we also aimed to identify reasons for why the notion of inspiration did not successfully trigger behavioural changes or, in other words, the limits of Olympic inspiration in terms of how many participation behaviour stages the event was able to inspire (Prochaska & Velicer, 1997). This is poorly understood.

Prochaska and Velicer (1997) suggested that individual behavioural changes are complex and unfold through various stages. We adapted the TTM model and incorporated the notion of Olympic inspiration into the research design. The five stages of the TTM were thus as follows: *precontemplation* (no intention of becoming physically active), *contemplation* (inspired by the Olympics to consider becoming physically active), *preparation* (inspired by the Olympics to plan PA), *action* (inspired by the Olympics to change sport or PA participation behaviour), and *maintenance* (fulfilling PA criteria for a sustained period).

In Beijing, 46% of respondents and, in London, 47% of respondents reported being inspired by the Olympics to increase their sport or PA participation (i.e., the *action* group). By contrast, 31% of Beijingers and 24% of Londoners reported that they had no intention of becoming physically active.

Figure 7. TTM: stages of sport and PA behaviour change.



Research confirming the existence of inspirational effects has highlighted that they tend to apply to people already participating in sport or PA on a regular basis (Ramchandani & Coleman, 2013; Chen & Henry, 2016). Therefore, at least two relevant research gaps existed at the start of our study: Little was known regarding the scale and characteristics of (1) the group who rejected the idea of Olympic inspiration (i.e., the *precontemplation* group) and (2) the groups of respondents who acknowledged Olympic inspirational effects but did not change their participation behaviours (i.e., *contemplation* and *preparation* groups) as well as regarding whether these groups had any intentions to change participation behaviours in the future. Filling these gaps has practical implications for policymaking and legacy leveraging and is important for enabling these groups to be carefully targeted and extra resources allocated to facilitate behavioural changes.

We therefore attempted to address these gaps with an innovative research design: We combined the TTM model with Gollwitzer's (1999) implementation intentions theory. This clarified the exact stage (*contemplation* or *preparation*) to which the effects of Olympic inspiration had progressed among people whose participation behaviours remained ultimately unchanged. Gollwitzer (1993) argued that someone becomes more likely to initiate a behaviour once they plan when, where, and with whom they will do the activities in question. Thus, with further extrinsic assistance, changes in participation behaviours may be more likely for those who plan and prepare to become physically active. The application of this theory improved understanding of the *contemplation* and *preparation* groups by establishing the extent to which they prepared to engage with sport or PA.

We found that 10% of Beijingers and 10% of Londoners acknowledged Olympic inspirational effects but did not change their sport participation behaviours (i.e., the *contemplation* and *preparation* groups). Within the *preparation* groups (for both London and Beijing), 13% (n = 4) of the respondents formulated no detailed plans to become physically active.

We therefore asked Londoners and Beijingers (in the *contemplation* and *preparation* groups) their plans to change their participation behaviour – when, where, and with whom they planned to participate in sport or PA. We found that they considered 'with whom to participate' more important for the 'trying a new sport or PA scenario' (50%) than for the 'increasing participation levels' scenario (0%). Moreover, respondents had more carefully considered *'when* to become regularly active/try a new sport' (54%) than '*where*' (50%) and '*with whom*' (25%).

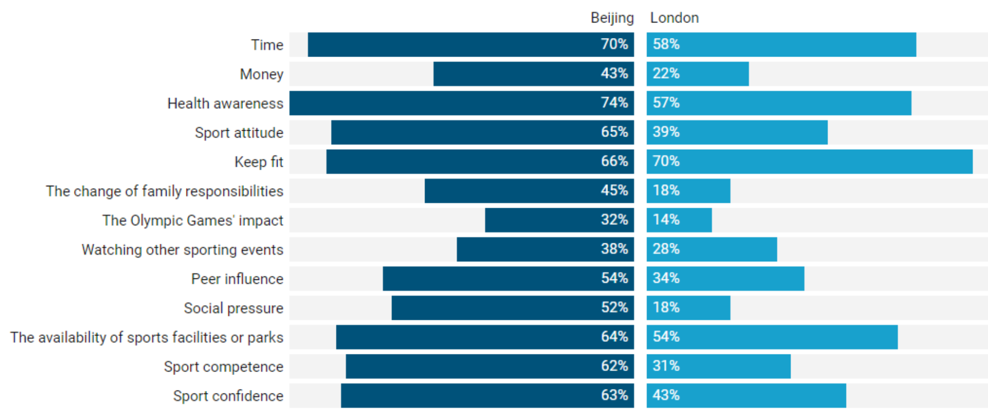
6.4 Factors that facilitated changes in participation behaviours

Informed by other literature and interview data, we identified a 14-item list of factors (external and internal variables) with the potential to change (enabling or prohibiting) participation behaviours (see Figure 8): time, money, health awareness, sport attitude, desire to improve fitness (keep fit), domestic responsibility, Olympic impacts (inspirational effects), other sporting events, peer influence, social pressure, sports facility accessibility, sport competence, sport confidence, and physical condition.

Amongst the 14 factors, time, sport attitude, sport facility accessibility, sport competence, and sport confidence exhibited a statistically significant association with behavioural changes. Notably, although the inspirational impacts of the Olympics were acknowledged to trigger changes in participation behaviours, the effects were perceived to be less significant than other fundamental intrinsic (sport competence, sport attitude, and sport confidence) and extrinsic factors (sport facility accessibility and time). This implies that the magnitude of Olympic inspirational effects was weakened when behaviour changes were restricted by fundamental intrinsic and extrinsic factors.

Figure 8. Factors that have impacted sport and PA participation behaviours.

% of respondents who considered the following factors were either very important or important for causing sport/PA behaviour change (n [Beijing] =399, n [London] = 168).



6.5 Two different contexts

In sporting-mega-event-related literature, little attention has been devoted to non-Western contexts despite the fact that three recent editions of the Olympic Games have been held in Asia (PyeongChang 2018, Tokyo 2020, and Beijing 2022). The issue of Eurocentrism (Brownell, 2009) therefore persists. This research has extended current knowledge regarding sport participation by focusing on not only a Western context, the United Kingdom, but also a Chinese context.

We identified a clear distinction between the two contexts in terms of respondents' reactions to the Olympics generally and towards the notion of 'inspiration as a result of event hosting', with Beijing residents being more likely to endorse the inspiration assumption (i.e., the assumption that the Olympics inspire sport participation) compared with London residents. This might have been due to differences in cultural attitudes and in how nationalistic the UK and Chinese education systems are. In addition, we found interpretations of the term 'inspiration' to differ subtly in the two contexts of China and the United Kingdom in terms of the routes through which inspiration might have worked. Our interview data revealed that 'sportsmanship' and 'Olympism' were imprinted in Beijing residents' minds, owing to a strong national and city-wide media campaign. Thus, the inspirational effect was arguably 'activated' for Beijing 2008, which has implications regarding individuals' perceptions of the Games as a causal contributor to changes in participation behaviour.

'The Olympics… how can I put it… It doesn't actually have a huge impact on individuals, I think, but it has a community impact: When everyone is in a kind of frenzy and excitement, even if you don't actually know what they're frenzied about, you go along with it, share the frenzy and excitement, and become influenced by others' emotions… You start to focus on the Olympics, and this is the real impact of the Games for Beijing.'

– A Beijing resident

Conclusion

In this project, we investigated the principal inspirational routes that motivated the general public in two case cities (London and Beijing) to increase sport participation or to try new sports and PA, and we identified factors that prohibited or facilitated behaviour changes within the context of sporting-mega-event hosting.

We found that, for Beijingers, the Olympic Games had a relatively positive inspirational impact on sport participation engagement and trying new sports, and, for Londoners, it had a moderate inspirational impact. In particular, when the routes of inspiration were unpacked, the Beijing residents perceived the elite-athlete-role model inspiration [1] to be the most effective pathway, followed by the Games as a whole [2], and the Games legacies [3], whilst the London residents considered the Games as a whole [2] to be the most effective pathway, followed by [1] and [3].

Of course, attitude changes do not equal behavioural changes. To investigate changes in participation behaviour, we first asked the research participants to indicate directly whether they believed that Olympic inspiration had increased their sport or PA participation; second, we verified the inspirational effects on sport or PA participation by calculating the differences in participation levels reported at the time of the survey compared with before the Games to understand whether the inspirational effects *actually* translated to any changes in participation behaviour.

We found that nearly half of the respondents surveyed in both cities stated that they had been inspired by the Games to increase their sport and PA participation levels (the *Action* group); approximately 10% of the surveyed residents acknowledged that the Games compelled them to consider becoming more physically active but not to commit to any behaviour changes (the *Contemplation* and *Preparation* groups); another 30%, approximately, reported zero inspirational effects (the *Precontemplation* group).

Particularly in relation to the *contemplation* and *preparation* groups (those who recognised inspirational effects but did not change their sport or PA participation behaviour), we suggest that, for event organisers and sports department to facilitate changes in participation behaviour, participation leveraging programmes should be designed to account for participants' time availability and for the geographical accessibility of the programmes, and for encouraging people to try new sports, paired participation is recommended for taster sessions.

The Olympic Games' inspirational impacts were more discernible amongst the Beijing residents surveyed compared with amongst London residents (although the London sample size was smaller than the Beijing one). In the Beijing sample, statistically significant differences were found for both inspirational routes [1] (Elite-athlete-role-model/trickle-down effects) and [2] (The Games' atmosphere/promotion of health-related benefits from sport participation) in the three participation groups (Increase, Decrease, and No change); in the London sample no statistically significant differences were found between the groups' analysis of variance results when the inspirational effects of the Games were examined.

The increase in sport and PA participation reported in the Beijing sample confirmed the potential of Olympic hosting to create positive sustainable participation change. However, Olympic inspirational effects were weakened in Beijing residents' opinion when other more fundamental intrinsic and extrinsic factors (e.g., time, sport competence, and sport confidence) were perceived to exert more influence on sport and PA participation. Although the inspirational effects of the London 2012 Games were acknowledged and corroborated by the surveyed London residents, few long-term sustainable participation behaviour changes were attributable to the Games.

Lessons learned

To support the future leveraging of sport participation impacts from the hosting of sporting mega-events, this project yielded the following points in terms of **lessons learned (knowledge contributions)**:

- Early planning of post-Games activities and initiatives would help access to ongoing participation opportunities for host citizens.
- To maintain a sustainable legacy from the Games, periodic leveraging actions are likely to enhance participation impacts. Leveraging actions should focus on offering detailed packaged participation plans (entailing the information regarding when, where and with whom the participation opportunities being offered) for individuals who are inspired by the Games but fail to capitalise on the inspirational effects (i.e., the *contemplation* and *preparation* groups).
- The life cycle for the leveraging of participation from event hosting should be longer. Currently, leveraging efforts are focused on the period prior to the Games and terminate one or two years after the event. With limited attention/resources devoted to participation leveraging after the Games, the frequently cited inspiration effects seem to be based mostly on nostalgic memories of the Games.
- The impetus from multiple events would be helpful for both cities to maintain the passion and excitement associated with sporting events. The hosting of a series of major sporting events after London 2012 (e.g., the London Anniversary Games, the World Athletics Championships, UEFA 2020, etc.) and, in Beijing's Olympic stadiums (the hosting of the 2022 Winter Olympic Games and the 2015 World Athletics Championships) helped showcase various sports, contributing to inspirational effects.
- Apart from hosting a series of sporting events after the Games, capitalising on the Olympics requires concrete legacy plans (clearly mapped participation pathways) for long-term benefits.
- Inspirational effects on sport participation are both propelled and confined by contextual features (political and cultural). Understanding the impact of the Games on sport participation requires a contextualised understanding of real phenomena.

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