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THE TRICKLE-DOWN EFFECT: WHAT POPULATION GROUPS BENEFIT FROM HOSTING MAJOR SPORT EVENTS?

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ABSTRACT

The trickle-down effect of major sport events was mostly examined for the host population at large. This study analyses whether some population groups benefit from hosting a major sport event like the 2006 Melbourne Commonwealth Games more than others. The trickle-down framework is tested using a comprehensive sample of people in Australia from 2005 and 2006 (n=12,993). Regression results show that younger people, less educated people, and people of Aboriginal or Torres Strait Islander origin are more likely to spend more time participating in sport as a result of Melbourne hosting the Commonwealth Games. Younger people with no formal education and people who are not in a relationship are more likely to take up a new activity. Older people, females, and the locals are more likely to gain a positive attitude. The results inform policy makers and sport event managers who plan for the 2018 Commonwealth Games on the Gold Coast, Australia.

KEY WORDS

Trickle-down effect; Commonwealth Games; Population groups

INTRODUCTION

Event outcomes can take a variety of forms with potential increases in grassroots sport participation being one form of it (Veal, Toohey, & Frawley, 2012). While event outcomes do simply occur and are measured after the event, event legacies can also be created by undertaking activities around the event that help creating long-term benefits (Chalip, 2004). Event outcomes can be classified into tangible or hard outcomes such as increased tourism, new or improved facilities and services, a more skilled workforce, or housing development and intangible or soft outcomes such as community pride, feel good factor, improved social capital and sport development at both elite and mass participation levels (McCartney et al, 2010; Preuss, 2005,

2007; Süßmuth, Heyne, & Maennig, 2010; Wicker, Hallmann, Breuer, & Feiler, 2012). Regardless of the classification used to group event outcomes, all approaches denote a development of social capital through sport development outcomes that are achieved in the form of a general increase in participation in physical activity and interest in sports. An increase in sport participation, however, is an intangible and largely unproven and controversial outcome attributed to major sport events.

The Commonwealth Games (CGs) is a relatively recent sport event that has its historic roots in the British Empire. All members of the Commonwealth of Nations such as Australia, New Zealand, Canada, England, Scotland, Wales, Northern Ireland, and India can take part in the CGs. Also, several British overseas territories and crown dependencies send teams to the CGs (Commonwealth Games Federation, 2013). The CGs are attractive to athletes from those countries because wins and medals are prestigious, but relatively easier to achieve compared with the Olympics since athletes from the United States, Russia, and China do not compete in the CGs (because these states are not members of the Commonwealth). The first CGs took place in 1930 in Hamilton, Ontario, Canada. Since the 1930s, the CGs grew from 400 participants and six events to about 4,500 athletes from 71 nations (Insight Economics, 2006). This growth has been accompanied by a parallel expansion of the event's expectations and legacies. Twelve years after hosting the 2006 CGs in Melbourne, Australia's Gold Coast City is the host of the 2018 CGs.

Research shows that the nature and quality of future mega events largely depends on the planning that takes place to engender value (Bramwell, 1997). Building on event outcomes generated when the event took place in the same country previously may be useful and inform planning because it may "contribute to planner's and managers' efforts to maximize the opportunities presented" (Reis, de Sousa-Mast, & Gurgel, 2013, p. 2). Therefore, planning for an increase in sport participation and designing well informed programs and strategies to leverage on sport development outcomes is critical for future hosts of mega sport events. Consequently, knowing which population groups are most likely to be affected, and in what ways is of great importance. In this regard, previous mega sport events can inform such policy concerns and program decisions to target various population groups and in particular the ones mostly in need.

The purpose of this study is to examine the trickle-down effect of the 2006 CGs in Melbourne, Victoria, Australia to various population groups in order to transfer the knowledge from the localized effects to planning for the 2018 CGs on the Gold Coast, Queensland, Australia. This study advances the following main research question: What population groups benefit from hosting major sport events? Based on the trickle-down effect, the effects of hosting major sport events on various population groups are conceptualized. The research question is analyzed using data from a comprehensive nationwide survey of Australian residents (n=12,993). This study contributes to host organizations' and sport event managers' understanding of the impact of the CGs on specific population groups. Also, the study promotes the notion of planning and being proactive in preparing for sport events in order to optimize trickle-down effects.

THE TRICKLE-DOWN EFFECT OF MAJOR SPORT EVENTS

It is generally believed that elite sport inspires individuals to take up exercise or become more active sport participants at the mass participation level (Sotiriadou, Shilbury, & Quick, 2008; Weed, 2009). This process is referred to as the trickle-down effect (Hindson, Gidlow, & Peebles,

1994; Hogan & Norton, 2000, Sotiriadou et al., 2008), the demonstration effect (Weed, 2009), or the Boris Becker effect (van Bottenburg, 2001). Regardless of the choice of term, the main premise of the trickle-down effect is that it is “a process by which people are inspired by elite sport, sports people or sports events to participate themselves” (Weed, 2009, p. 4). This definition denotes that the trickle-down effect is a result of athlete performances, elite athletes (sport stars as personalities), and major sport events. The focus of this paper is on the latter and in particular the effects of the 2006 Melbourne CGs on different population groups in Australia.

Major sport events can influence people in several ways. Among those are effects on people’s decision to take up sport as a new activity, changes in the amount and frequency of exercise people do, and changes in people’s attitude. A study on the effect of three mega sport events shows that major events can play a role in sparking people’s desire to take up exercise or participate more frequently (iRamchandani & Coleman, 2012). On the other hand, research claims that the trickle-down effect cannot inspire those who have not previously participated in sport to take up sport (Coalter, 2004; Weed, 2009). It can encourage those who already participate to participate more; those who stopped playing to participate again; and switch between sport activities (Weed, 2010).

Previous findings regarding the effects of hosting major sport events on people’s sport participation patterns range from suggesting some short term positive effects; no relationship; and decreases in participation or taking up sports. Hanstad and Skille (2010), for instance, noted a short-term increase in participation after the Sydney 2000 Olympic Games and the Lillehammer 1994 Olympic Games. Other studies indicated an accelerated growth of the number of rugby players in Australia two years after organizing the World Cup of 2003 (Frawley & Cush, 2011; Veal et al., 2012). Hogan and Norton (2000), however, found no relationship between Australian success at the Olympic Games and levels of mass participation. Similarly, Vanden Heuvel and Conolly (2001) observed no change in sport/physical activity participation rates among Australians before or after the staging of the 2000 Olympic Games in Sydney. In relation to the Melbourne CGs, Veal et al. (2012) found that between 2005 and 2007, 13 of the 18 CGs sports experienced a decline in participation in Victoria and five experienced an increase.

While some estimates suggest that participation did increase following the hosting of mega events, “the failure of relevant organisations to maintain an adequate and consistent data collection regime makes this conclusion extremely speculative” (Veal et al., 2012, p. 155). This quotation highlights the difficulties associated with measuring event outcomes by collecting adequate data. Also, an isolation of event outcomes may be difficult because several factors can influence people’s sport participation patterns such as age, occupation, time, education, income (Downward & Rasciute, 2010; Lera-López & Rapún-Gárate, 2007; Wicker, Breuer, & Pawlowski, 2009). All in all, Weed, Coren and Fiore (2009) concluded that there is no scientifically valid evidence of the effectiveness of the trickle-down effect of major sport events on participation. These inconclusive and sometimes contradicting results suggest that further research is necessary to illuminate the role of major sport events on people’s decision to start exercise or increase their participation frequency.

In addition to effects on sport participation, hosting major sport events can also influence people’s attitude. Previous research supports the notion that attitudinal involvement and behavioural involvement are positively correlated (Beaton, Funk, Ridinger, & Jordan, 2011).

Moreover, sport events promote strong attitudes toward exercise among participants who are least active before the event (Funk, Jordan, Ridinger, & Kaplanidou, 2012). In their empirical study on the sport development process of 35 sports in Australia, following the Sydney 2000 Olympic Games, Sotiriadou and Shilbury (2009) identified indirect trickle-down effects including an increase in the publicity of sports, the public's interest/awareness and people's pride/inspiration. Ohmann, Jones, and Wilkes (2006) found that the 2006 FIFA World Cup left Germans with a greater sense of national pride and community. Similarly, community pride and spirit were rated as the biggest benefits for South Korea after hosting the 2002 FIFA World Cup (Kim & Petrick, 2005). These findings denote that major sport events have a 'halo' effect and can elevate people's excitement levels, euphoria and pride.

The effects of major sport events can differ among population groups and can thus depend on people's demographics such as age, gender, level of education, occupation, and origin. Yet, previous research looking at the effects on specific population groups is limited. With regard to age, previous research shows that younger people are more likely to get inspired to take up exercise as a result of major sport events (Feddersen, Jacobsen, & Maennig, 2009; Frawley & Cush, 2011). Consequently, older people were less likely to be inspired to take up a new activity as a result of a mega sport event (Frawley & Cush, 2011). Thus, it is suggested that age is negatively associated with trickle-down effects.

With regard to gender, a study on the impact of the Barcelona Olympic Games found that the most significant participation growth was experienced by females with their participation increasing from 35% in 1989 to 45% in 1995 (Truno, 1995). Consequently, it is assumed that females are more influenced by hosting major sport events than males in this research. Yet, having children negatively affects sport and exercise participation (Verhoef, Love, & Rose, 1993). With respect to marital status, married parents were found to be least likely to exercise (Verhoef et al., 1993). Thus, having children and being in a relationship can mitigate possible trickle-down effects.

Studies on the level of education reveal that higher levels of education are in general positive correlated with sport participation (Minnaert, 2012; Wicker et al., 2009). Given Weed's (2009) proposition that trickle-down effects are more likely to impact people who are already participants, it can be suggested that people with higher levels of education may benefit more from their country hosting a major sport event and may be more likely to increase the frequency of participation and engagement with sport. Yet, levels of education may be positively linked to occupation which can be an indicator of work hours and available time. Therefore, high weekly workloads may mitigate potential trickle-down effects. Very little is known about patterns of physical activity depending on peoples' origin and in particular for Aboriginal people (Thompson et al., 2000). Some existing evidence shows participation rates amongst ethnic minorities are lower than those for the white population (Rowe, Adams, & Beasley, 2004). No studies have examined the trickle-down effect of major sport events for people of various origins and it is therefore difficult to formulate any assumptions.

Locality, or else the geographical location of the event, appears to determine people's decision to get involved with the event. When Sydney won the bid for the Olympics, "75,000 people applied to be volunteers. ...three quarters were from NSW" (Anonymous, 2005, p. 8). These numbers

suggest that mainly people from the same state want to be engaged with the event in some form, even at an international mega event like the Olympic Games. Similarly, only about 10-15% of the 14,500 volunteers working at the 2006 CGs in Melbourne were not from Victoria (Melbourne 2006 Commonwealth Games, 2006). Thus, it can be suggested that locals benefit more from hosting major sport events than people who live in other states.

Despite the plethora of studies on sport participation that examine population characteristics, there are no efforts to combine this knowledge to the effects of major sport events on specific population groups. Trickle-down studies tend to neglect this aspect. This dearth of knowledge maybe partly because examples of studies that have ventured on measuring the trickle-down effect (Hanstad & Skille, 2010; Virginov & Hills, 2008) show that trickle-down is an intangible effect, and significantly more complex to measure, evaluate, plan for, and manage (Atkinson, Mourato, Szymanski, & Ozdemirogly, 2008; Sadd & Jones, 2009). The complexity of the trickle-down effect is evident by the existence of conflicting and inconclusive findings of various studies (even on measuring the trickle-down effect of the same event), leaving a gap in the literature.

In the absence of a solidified argument in support of the trickle-down effect, Weed et al. (2009) express the need for more research in this field that provides an understanding how participation legacies can be created and sustained. In support of this, Frawley and Cush (2011) suggest that future research should look at various demographic groups and examine the impact of hosting major sport events on their sport participation patterns. In addition to population-specific sport event benefits, the literature calls for a localized understanding of the trickle-down effect in order to transfer knowledge to future hosts of the same event (Chalip, 2004). This study is a response to the call for researchers to fill in these gaps in knowledge.

METHOD

Data Source

The trickle-down effect on various population groups is examined using data from the Exercise, Recreation and Sport Survey (ERASS) in Australia. The ERASS is authorised by the Australian Sports Commission and the state and territory government agencies that are responsible for sport and recreation. The ERASS assesses the physical activity of Australians on an annual basis since 2001 (Committee of Australian Sport and Recreation Officials [CASRO], 2001). Each annual survey consists of some core questions regarding physical activity and sport, and some additional questions on specific topics. This study is based on ERASS data from the years 2005 and 2006 because during these two years, a set of questions was added to capture information about the 2006 Melbourne CGs. These questions have been used in previous research to analyse changes in sport participation levels (Veal et al., 2012). Yet, the analysis was only descriptive providing percentages of the pre-games and post-games survey.

The ERASS is based on random samples that are stratified by state and territory. Potential participants are selected from the Electronic White Pages. Surveys are conducted using the Computer-Assisted Telephone Interviewing (CATI) system (last birthday method). In 2005, n=13,726 persons aged 15 years and older were surveyed (response rate: 34%); in 2006, the sample was n=13,708 (response rate: 42%). For the analysis in this study, a sub-sample is used that contains all people who have completed the questions about the 2006 Melbourne CGs. These are n=3,253 people in 2005 and n=9,740 in 2006 resulting in a total sample of n=12,993 for

this research. It must be considered that some population groups are under- or overrepresented in the samples. Therefore, the data are weighted by state, region, age, and gender using the Australian Bureau of Statistics (ABS) weights. In doing so, the representativeness of the sample and the external validity of the findings are improved.

Measures and Variables

Table 1 summarizes all variables used in this study. Three measures were used to capture the trickle-down effect (i.e., the influence of Melbourne hosting the 2006 CGs). In the survey, it was assessed to what extent people were influenced by Melbourne hosting the 2006 CGs. In detail, people were asked if they have spent more time participating in physical activity for exercise, recreation, and/or sport and whether they have taken up a new activity. If people agreed, the dummy variable is coded 1 (yes). Note that in ERASS surveys, physical activity implies any physical activity for exercise, recreation, and/or sport (CASRO, 2010). While the first two measures are activity or behaviour related, the third measure relates to people's attitude. The influence of Melbourne hosting the 2006 CGs on people's attitude was also assessed in the survey. The three answer categories were recoded into a dummy variable labelled 0 if influence was more negative or no difference and 1 if influence was more positive.

To investigate what population segments benefit from hosting the CGs, several characteristics of the Australian population were chosen. Participants were asked what age they were in an open-ended question. The resulting metric age variable was recoded into six age group dummies with equal interval sizes (i.e., ten years, except for the last group). The gender variable was 0 for female and 1 for male. People were also asked about their educational level in a closed question. The answers were summarised into five categories (i.e., still at school, no secondary education, high school, certificate/trade qualification or undergraduate diploma, university degree) that were recoded into dummy variables. Two variables give information about people's availability of time. People were asked about their weekly working hours in an open-ended question, while the presence of children at home was assessed with a yes-no question. The variable relationship was obtained from the marital status of the respondents that stems from a closed-ended question. The categories married and de facto were recoded into 1 (yes) and the categories separated, divorced, widowed, and never married into 0 (no). With regard to origin, people were asked whether they are of Aboriginal or Torres Strait Islander origin. The variable origin was coded 1 (yes) if this was the case. The study also controlled for the state people live in and for the year of the survey (Table 1).

Data Analysis

The data analysis consisted of two main steps. First, the data were checked once again for plausibility and content validity, even though this check was already done by the institutions responsible for the survey. New variables were calculated or existing variables were recoded as stated above. For all variables, people who answered refused or do not know were set to missing values. Descriptive statistics were provided to give an overview of the sample structure. Recall that all results were weighted by ABS weights.

Second, regression analyses were run to identify what population groups benefit from hosting the CGs (and to answer the main research question of this study). Altogether three logistic

regression models were estimated with more time participating, new activity, and positive attitude as the dependent variables.

Table 1. Overview of Variables

Variable	Description	Scale
<i>Influence by Melbourne hosting Commonwealth Games</i>		
More time participating	Person has spent more time participating in activity for exercise, recreation, and/or sport (1=yes)	Dummy
New activity	Person has taken up new activity for exercise, recreation and/or sport activity (1=yes)	Dummy
Positive attitude	Influence on attitude (0=more negative or no difference; 1=more positive)	Dummy
<i>Population characteristics</i>		
Age group	Age (in years); six age groups with equal interval sizes: 15-24, 25-34, 35-44, 45-54, 55-64, 65 and older	Ordinal
Gender	Gender (0=female, 1=male)	Dummy
Education	Level of education; classified in five groups (still at school, no secondary education, high school, certificate/trade qualification or undergraduate diploma, university degree)	Nominal
Work hours	Number of working hours per week	Metric
Children	Children still live at home (1=yes)	Dummy
Relationship	Person is in a relationship (1=yes)	Dummy
Origin	Person of Aboriginal or Torres Strait Islander origin (1=yes)	Dummy
State	Federal state of respondent	Nominal
Year	Year of survey (0=2005, 1=2006)	Dummy

All population characteristics from Table 1 served as the independent variables. Five age group dummies were included in the regression, while the remaining dummy (65 years and older) serves as the reference category. The same procedure was applied to education and state where four (education) respectively seven dummies (state) were entered in the regression. The reference categories were no secondary education and Australian Capital Territory. The analysis also controlled for the year of the survey. Before entering the independent variables into the regression, they were checked for multicollinearity using bivariate correlation analyses. Since all correlation coefficients were far below the suggested threshold of .9 (Tabachnick & Fidell, 2007), there should have been no multicollinearity issues. An α -level of .05 was used for all statistical tests.

RESULTS

The descriptive statistics give an overview of the sample structure (Table 2). They show that 49.0% of the respondents are male. People in the sample were on average 42.4 years old and well distributed among age groups. With regard to education, 27.1% of respondents have a university degree, followed by high school (25.2%), and a certificate or trade qualification or an undergraduate diploma (24.8%). More than one fifth (21.7%) had no secondary education and 5.0% of respondents were still at school. People worked on average 25.1 hours per week. Approximately one third of respondents (31.0%) had children who were still living at home and more than half (56.7%) of respondents were in a relationship. Only 1.3% of all respondents were of Aboriginal or Torres Strait Islander origin. Altogether, 6.9% of respondents have spent more time participating because of Melbourne hosting the CGs and 5.9% have started a new physical

activity. The influence on people's attitude was higher since 30.9% of respondents stated that Melbourne hosting the 2006 CGs had a positive influence on their attitude.

Table 2. Descriptive Statistics (weighted)

Variable	% of respondents	Mean (SD)
More time participating	6.9	/
New activity	5.9	/
Positive attitude	30.9	/
<i>Age group</i>		
15-24	19.5	/
25-34	18.3	/
35-44	18.9	/
45-54	17.4	/
55-64	12.7	/
65 and older	13.2	/
Gender	49.0	/
<i>Education</i>		
No secondary education	21.7	/
Still at school	5.0	/
High school	25.2	/
Trade/diploma	24.8	/
University	27.1	/
Work hours	/	25.1
Children	31.0	/
Relationship	56.7	/
Origin	1.3	/
<i>State</i>		
New South Wales	32.4	/
Victoria	25.6	/
Queensland	19.1	/
South Australia	7.6	/
Western Australia	10.3	/
Tasmania	2.4	/
Northern Territory	0.9	/
Australian Capital Territory	1.7	/
Year	75.0	/

The regression results are summarized in Table 3. From model 1 for more time participating, it can be seen that age group, education, work hours, origin, and year have significant effect on the dependent variable. With regard to age, the results show that people aged 15 to 24, 25 to 34, and 55 to 64 were significantly more likely to spend more time participating than people in the last age group (i.e., 65 years and older) which serves as the reference category. This means that people in the two youngest age groups and older people have benefited from hosting the CGs. The education effects reveal that more educated people were less likely to spend more time participating because of the 2006 CGs in Melbourne. People having graduated from high school or university as well as people having obtained a certificate or trade qualification or an undergraduate diploma were significantly less likely to spend more time participating than people without secondary education who represent the reference category. Consequently, fewer educated people (i.e., those without any formal education) were more likely to benefit from

hosting the event. Work hours has a negative effect on the dependent variable. This means that people who work many hours per week are less likely to spend more time participating because of the CGs. Thus, only people with low weekly workloads benefit from hosting the Games. Interestingly, origin has a significant positive effect on the dependent variable. People who are of Aboriginal or Torres Strait Islander origin are more likely to spend more time participating because of the CGs. The significance of the year variable supports the importance of the time frame. In 2006, the year of the event, people were more likely to benefit from it. The independent variables explain 10.3% of the variation in the dependent variable of model 1.

Model 2 shows what people were significantly more (or less) likely to take up a new activity because of the CGs (Table 3). The results indicate that age group, education, and relationship have a significant impact on the dependent variable. Regarding age, young people aged 15 to 24 were more likely to take up a new activity than people in the oldest age group (65 years and older). Thus, young people benefited more from hosting the event. Again, three education variables have a negative effect on the dependent variable. People who have graduated from high school or university or have obtained a certificate or trade qualification or an undergraduate diploma were less likely to take up a new activity compared with people who have no secondary education. Thus, less educated people benefited more from hosting the CGs. Also, the negative effect of relationship indicates that people who are not in a relationship were more likely to take up a new activity because of the CGs. Thus, it seems that singles benefited more from the event. In model 2, the independent variables explain 11.0% of the variance of the dependent variable.

Model 3 shows what people had a more positive attitude because of Melbourne hosting the CGs (Table 3). The results reveal that age group, gender, work hours, relationship, Victoria (the Australian state where the Melbourne CGs were hosted), and year have a significant impact on the dependent variable. Here, the results for age are opposite to the previous two models. People in all age groups were significantly less likely to have a positive attitude compared with people in the oldest age group (65 years and older). Contrary to activity related behavior, older people benefited more from hosting the event in terms of positive attitude. The negative effect of gender shows that females were more likely to gain a positive attitude from hosting the CGs. The effect of work hours is also negative suggesting that people with lower weekly workloads were more likely to have a positive attitude due to the Games. The positive effect of relationship shows that people who are in a relationship were significantly more likely to have a positive attitude than people who were not in a relationship. In summary, females, people with lower workloads, and people who were in a relationship benefited more from the event in terms of positive attitude.

While all state dummies were insignificant in the first two models, Victoria has a significant positive effect in model 3. This means that people living in Victoria, the state which hosted the CGs, were more likely to have a positive attitude because of the Games. The year of the survey was also significant indicating that people who were surveyed in 2006, the year of the event, were more likely to report a positive attitude. Consequently, particularly locals benefited from hosting the CGs, but only in the year of the event. In model 3, the independent variables explain only 3.6% of the variation in the dependent variable.

Table 3. Summary of Regression Results

	Model 1: More time participating	Model 2: New activity	Model 3: Positive attitude
<i>Age group</i>			
15-24	1.384***	1.099**	-.289***
25-34	1.032*	.655	-.442***
35-44	.637	.881	-.395***
45-54	-.217	.240	-.393***
55-64	1.035*	.265	-.213**
65 and older	REF	REF	REF
Gender	-.050	-.035	-.167***
<i>Education</i>			
No secondary education	REF	REF	REF
Still at school	-.069	-.339	.136
High school	-.583**	-.933***	.011
Trade/diploma	-.547*	-.559*	-.024
University	-.472*	-1.193***	-.107
Work hours	-.010*	-.007	-.007***
Children	.271	.122	-.041
Relationship	-.166	-.540*	.163***
Origin	1.251***	.068	.239
<i>State</i>			
New South Wales	.438	.196	.126
Victoria	1.081	1.052	.410*
Queensland	.395	.355	-.008
South Australia	.377	.114	.142
Western Australia	.144	-.472	.062
Tasmania	.254	-.147	-.121
Northern Territory	.106	.164	-.083
Australian Capital Territory	REF	REF	REF
Year	.618**	-.007	.125**
Constant	-4.058***	-2.987***	-.560**
R^2	.103	.110	.036
χ^2	149.939	133.842	321.805
-2LL	1666.576	1351.003	15180.534
p	<.001***	<.001***	<.001***

Note: *** p <.001; ** p <.01; * p <.05; displayed are the unstandardized coefficients.

DISCUSSION

This study looked at the trickle-down effect of the 2006 CGs in Melbourne. The trickle-down effect is relatively small since only a small share of people spent more time participating or took up a new activity. This finding is in accordance with previous research which had difficulties in documenting a trickle-down effect (Feddersen et al., 2009; Veal et al., 2012; Weed, 2009). More importantly, this study examined how different population groups benefit from hosting major sport events. The regression results showed that younger people, people with lower educational levels, females, people of Aboriginal or Torres Strait Islander origin, and locals benefit to a

significantly greater extent from hosting major sport events. The fact that Aboriginal people are motivated to play more sport is a very encouraging finding from a policy perspective and in terms of promoting physical activity for minority groups and socially excluded groups in society. Aboriginals account for 3.6% of the total population of Queensland (ABS, 2011), and 19.0% of them are aged 15-24 years. What that means for the 2018 CG on the Gold Coast is that it is very likely that this group of people will be inspired by the event. Similarly, people with lower educational levels were more inspired by the event to spend more time participating or take up a new activity. Thus, disadvantaged groups of society such as people of Aboriginal descent and lower educated people should be prioritized in public government actions to have access to opportunities that would capitalize on their interest in taking up exercise or play more sport after the sport event is over. Moreover, the study showed that younger people were also more likely to spend more time participating and take up a new activity as a result of Melbourne hosting the CGs. Therefore, policy makers should also capitalize on this finding and provide opportunities that the sport participation of young people can be sustainable.

The locals (i.e., residents of Victoria) were found to be more likely to gain a positive attitude as a result of Melbourne hosting the CGs. This finding could be explained on the basis that locals are more likely affected because they get more involved with the pre, during, and post event activities, such as volunteering in various forms and shapes. As such they are closer to the hype and the media attention drawn to the event. In fact, Weed (2009) suggested that the demonstration effect is more effective where there is a local connection. Brent and Smith (1991) argued that the region which hosts the event is affected in many ways. In their study on the impact of mega sport events to the city of Calgary, they reported a dramatic increased level of awareness. These findings also reiterate Ramchandani and Coleman's (2012) suggestion that for the trickle-down effect to occur, audiences would have to first feel inspired by the event experience.

The results show that various population groups developed a positive attitude as a result of the CGs. These changes in attitude are collectively coined with the term psychic income (Burgan & Mules, 1992). However, Smith (2009) argued that researchers are yet to provide further empirical support as to the longevity of this psychic income. This is consistent with the findings of this study that the trickle-down effects of major sport events are stronger on the year of the event. Some evidence points towards the notion that engaging the locals in the bid for the event, during, and after the event may sustain this positive change of attitude (Agha, Fairley, & Gibson, 2012). In practical terms, this implies that when locals engage with event related processes for example through volunteering and have opportunities to voice their concerns and feelings for example in community consultation and forums, they are more likely to experience greater and longer lasting positive attitudes (Gursoy & Kendall, 2006).

Generally speaking, the study of event leverage has a strategic and tactical focus (Chalip, 2006). The findings of this study offer a robust and empirical evaluation of trickle-down effects that can inform policy makers and sport event managers on developing strategies to gain sport development outcomes from future events. The CGs have the potential to impact the behavior of specific population groups and clearly there are a number of factors that can be leveraged as a result. These findings help identify strategies and tactics that can be implemented prior to and during the 2018 CGs on the Gold Coast to generate particular and population-specific trickle-

down outcomes. Since the overall effects are relatively small (only 5.9% of respondents took up a new activity and 6.9% spent more time participating), this study stresses the need for undertaking activities that foster the creation of event legacies (Chalip, 2004). This finding is not unique to the CGs examined in this study; it also applies to other mega sport events worldwide (Hindson et al., 1994; McCartney et al., 2010). While the research is limited to the Australian context and specific population groups like Aboriginals may not be relevant in other countries, the findings indicate that some population groups are more likely to benefit from major sport events than others. This finding may be applicable to other sport events worldwide. Such possible event outcomes need to be fostered and sustained through leveraging activities before, during, and after the event (Chalip, 2004). Moreover, population groups that are less likely to benefit from major sport events should not be overlooked since more careful strategic planning may be needed to achieve participation legacies among those groups.

CONCLUSION

This study used the trickle-down effect framework and applied it to various population groups to identify who the key beneficiaries of hosting major sport events are. The results show that these are younger people, less educated people, females, people of Aboriginal or Torres Strait Islander origin, and the locals. The findings can offer an insight in view of planning for legacies for the 2018 CGs on the Gold Coast, Australia. The study showcases that countries that host the same event can leverage on previous knowledge to build sustainable and long term participation growth. The trickle-down effect framework was useful for categorizing population groups and identifying which groups benefit more than others and for what reasons. Therein lies the strength of this study and its theoretical contribution for it is likely that previous studies are inconclusive or contradicting because they examined the trickle-down effects on the population at large and not specific.

This study has some limitations that represent directions for future research. First, the trickle-down effect measures represent only subjective perceptions of people; they do not measure objectively whether people have indeed spent more time participating or took up a new activity as a result of Melbourne hosting the CGs. This shortcoming should be addressed in future studies. Also, in-depth interviews with representatives from each population group would have been useful qualitative data to support the existing findings and gain a deeper understanding of the reasoning behind people's behaviors and decisions. Second, the trickle-down effects are limited to the year of the event. It would be useful to assess whether the observed effects are sustainable and whether changes in behavior last several years.

Third, most studies on event leverage including this one examine the effects of events following the event using a post hoc approach. Although post hoc studies are in general considered less suitable for event planning (Bramwell, 1997; Chalip, 2006), this study, however, demonstrates that the post hoc examination of trickle-down effects can be very favorable to future organizers for other major sport events, in particular events that are similar in size and scope and specifically if the host is the same country. Thus, a good opportunity to consider the results of this study is the 2018 CGs that are also hosted in Australia.

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