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Scrutinizing the sport pyramid metaphor: an examination of the relationship between elite success and mass participation in Flanders

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Many governments use the trickle-down or demonstration effect to justify their high investments in an elite sport. The assumption is that elite success increases mass participation. Evidence of a relationship between elite success and mass participation is fragmented, and previous studies have mostly failed to demonstrate a connection. Nevertheless, many authors assert the need for more research on this relationship. This study examines the effect of elite sport on mass participation. The study uses Pearson's correlations to analyse the relationship between membership data and athlete success (using the elite sport index) in Flanders over the past 15 years. The membership figures from Flanders were compared with figures from the Netherlands to identify the common trends. Analysis across 20 sports revealed no consistent relationship between membership levels and success. Positive correlations were notable in Flanders in four of the eight sports in which elite Flemish competitors achieved significant international successes during the study period (athletics, gymnastics, judo and tennis). The analysis suggests that a trickle-down effect is not likely to occur automatically but might be found under specific conditions. This leads us to call for new studies that bypass the question of whether there is such a relationship and concentrate on why, how and when this relationship occurs.

Keywords: sport pyramid; elite sport; mass participation; demonstration effect; trickle-down

Introduction

Governments tend to justify large investments in the elite sport using the argument that the elite athlete success and hosting international sporting events generate numerous positive outcomes. These benefits include improved national identity, pride, international prestige and diplomatic recognition, individual development of talented athletes and the capacity to inspire increased mass participation in sport (Houlihan and Green 2008, van Bottenburg *et al.* 2011, De Croock *et al.* 2012). However, there is inadequate evidence to support these claims that are described as *storylines* by Fischer (2003 cited in Houlihan *et al.* 2009, p. 5):

Sport, as is clear from even a cursory review of the contemporary policy, is replete with deeply entrenched 'storylines', that elite success has a powerful demonstration effect on the mass of the public . . . storylines are not necessarily false, but their persistence and impact is not related to the quality or quantity of evidence available.

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Because such outcomes of elite sport are assumed to be self-evident, no further evidence appears to be required for governments to justify their significant investments in the pursuit of medal winning capability (Grix and Carmichael 2012). According to Green (2004) 'sport is understood as an intrinsically "good" thing . . . and elite sport policy is framed in a positive, discursive nature allowing few possibilities for thinking otherwise' (p. 367). These policy concerns have led to an increased discussion on the legacy of elite sport investments within the sport policy literature (e.g. Girginov and Hills 2008, Houlihan *et al.* 2009, Houlihan and Green 2011, Department for Culture, Media and Sport 2012, Grix and Carmichael 2012, Leopkey and Parent 2012).

The question of why nations should care about winning medals, and therefore why they should invest in elite sport, remains unanswered, and the elevated status of elite sport remains uncritically accepted (Coalter 2007). The unproven relationship between elite success and mass participation leads increasingly to tensions between opposing the political priorities of investing in an elite sport for a small group of athletes, and developing a wide range of organizations and facilities for the mass participation users (van Bottenburg 2003, Houlihan and Green 2008). The aim of this paper is to examine the relationship between the elite sport and mass participation in Flanders, the Dutch-speaking region of Belgium. In particular, this paper investigates one facet of the trickle-down effect by analysing the statistical relationship between international sporting success and membership figures in 20 sports. Accordingly, the research question is: 'What is the association between the international sporting success and mass participation membership figures?' Related questions, concerned with understanding how, why and under what circumstances there is a relationship, lie beyond the scope of this paper.

The sport pyramid metaphor

The relationship between the elite sport and mass participation is often referred to by using the sport pyramid analogy but the literature justifying its use remains fragmented and anecdotal (van Bottenburg 2003, Green 2005, Sotiriadou and Shilbury 2009). Traditionally, the elite and mass participation sports have been seen as interrelated and mutually dependent. In many sports, a large base of mass participation numbers is believed to provide a positive breeding ground for elite sport. In turn, elite sport is regarded as attracting young children to sports because of the inspiration provided by the elite athletes and the attention given to international sporting success. This is the origin of the often used but rarely questioned sport-pyramid metaphor (Heinilä 1982, Renson 2002, van Bottenburg 2003, Green 2005, Sotiriadou *et al.* 2008, Grix and Carmichael 2012). This pyramid metaphor has been criticized because many people practise a sport without any desire to ascend to a higher level (Eichberg *et al.* 1998). In addition, the elite sport cannot be regarded as a simple extension of mass participation because it is possible to build high-level competition systems without relying on a broad participation base (van Bottenburg 2003, Green 2005, De Bosscher and van Bottenburg 2011). Furthermore, athletes are obliged, at increasingly younger ages, to choose between a development in a mass participation structure and an elite sport approach (Eichberg *et al.* 1998). Elite and mass participation sports continue to grow apart, and the connection between them is being placed under an increasing strain. This divergence puts pressure on public policies that use this pyramid metaphor to legitimize their investments in either one of these areas (De Bosscher *et al.* 2008b).

The search for evidence: the trickle-down effect

The argument that elite athletes have the power to inspire young people rests on the assumed existence of the *demonstration effect* (Weed 2009), sometimes called the *trickle-down effect* (Hogan and Norton 2000, Sotiriadou *et al.* 2008), or the *Boris Becker effect* (van Bottenburg 2001). The demonstration effect is defined by Weed (2009) as ‘a process by which people are inspired by elite sport, sports people or sports events to participate themselves’ (p. 4). This definition indicates that the inspiration of elite sport can be due to:

- (a) The inspirational function of *elite performances*;
- (b) The inspirational function of *elite athletes* (sport stars as personalities); and
- (c) The inspirational function and legacy of *elite events*.

These independent factors may affect mass participation (the dependent factor). The broad effects of the independent factors can be further examined in relation to four areas:

- (a) The effects on participation in sport. These effects can be examined at the following four stages of involvement: the attraction (or recruitment of new participants); the retention (or the motivation and engagement to continue with the sport); the advancement to higher levels of competition; and the nurturing stage, associated with increased commitment and a move to the elite level (see Green 2005, Sotiriadou *et al.* 2008 for more details¹);
- (b) The effects on the choice of sport;
- (c) The effects on behaviour within the sport (e.g. the choice of a certain position in a team; the inspiration to copy techniques, tactics or possibly malpractices); and
- (d) The effects on behaviour outside the sport (e.g. clothing, hairstyle, music preferences, general values on issues such as drugs, gender and racism).

Following this division, Appendix provides an overview of a number of these studies. It shows research is often limited to the so-called ‘grey’ literature (e.g. conference papers, in-house papers) (Grix and Carmichael 2012). The examination of the relationship between the elite and mass participation is not straightforward as the trickle-down effect is difficult to isolate in empirical studies. For example, changes in participation can be explained by other short-term determinants, such as changes in the availability of sport infrastructure and living in an activity-friendly neighbourhood (Wicker *et al.* 2012), the effect of peers, the status of a sport in a school, activities organized by sport organizations to attract young people or even increases in income or the Gross Domestic Product. Because of the complicated nature of these influences, the available research has not succeeded in finding a clear evidence that elite success has a trickle-down effect on the mass participation. The next section will discuss the evidence for the impacts of the three independent factors.

The inspirational function of elite performances

Most studies that explore the relationship between elite athletes’ performances and mass participation belong to the grey literature in the policy and management fields (see Appendix). Most of these studies use correlation or regression analyses to explore the relationship between the membership figures and elite success, mostly within one sport. These studies provide mixed results. For example, various researchers identify counter-

effects in some sports. These are sports that have been successful over time or have had outstanding athletes but mass participation rates have decreased (e.g. Stokvis and Minnee 1986, van Bottenburg 2003, Steward and Nicholson 2004, Green 2005, Feddersen *et al.* 2009). This was, for instance, the case with tennis in Germany following Boris Becker's and Steffi Graff's period of success, and with volleyball in the Netherlands following a gold medal win in the Atlanta 1996 Olympic Games. Steward and Nicholson (2004) did not find any significant positive correlation between elite success and participation numbers in six sports in Australia over a 14-year period.

Other studies have found positive relationships between performances and participation numbers. For example, Hanstad and Skille (2010) found positive correlations between the mass participation (measured as the number of registered athletes) and Olympic Games/world championship medals ($r = 0.597$; $p < 0.05$) and top 15 places ($r = 0.690$; $p < 0.05$) in cross-country skiing and shooting in Norway. A study by De Bosscher and De Knop (2003) reveals that success in tennis in 43 European nations was highly correlated with the number of registered tennis players ($r = 0.724$; $p < 0.001$) and the number of tennis courts ($r = 0.858$; $p < 0.001$). Finally, van Bottenburg (2002, 2003) found a significant correlation between the percentage of the population participating only in an organized sports and the number of medals per million inhabitants in the 20 European nations ($r = 0.535$; $p < 0.01$). Interestingly, this correlation increased when the intensity and competitiveness increased.

When considered collectively, the above studies suggest that there is no clear evidence of that there is an effect, or that there is not. The results suggest and that if a relationship does exist, it may be sport-, country- and context-specific. Weed (2009), in his study with 1509 rugby and cricket participants in New Zealand, concludes that the demonstration effect as a consequence of elite success does not have a significant impact on those who have rarely or never participated and are therefore not already emotionally engaged with the sport. Weed found that the demonstration effect did, however, impact those already engaged with a sport in three ways: it encouraged a re-engagement of lapsed participants, it brought about an increase in participation frequency among current participants and among current participants it increased the likelihood of individuals switching between activities. Furthermore, the demonstration effect can be influenced by other variables, such as media coverage, funding, programmes for mass participation and other influences (van Bottenburg 2003, Feddersen *et al.* 2009). Consequently, the nature of the relationship is complicated and these factors are difficult to analyse. Questions about the mechanisms that affect mass participation therefore remain unanswered.

The inspirational function of elite athletes (sport stars as personalities)

One of the best-known explanations for rises in the popularity of particular sports is that a participation is boosted in response to wins by champions who capture the public's imagination (van Bottenburg 2001). This research area relates to the effects of role models. The literature in this area is far more developed and originates primarily from sport psychology research, either in the context of individuals of outstanding achievement (e.g. Lockwood and Kunda 1997) or in the context of people who have qualities we would like to possess (e.g. Guiliano *et al.* 2007). This literature offers insights into what role models the young people choose, why they choose them, whether these role models influence young people's behaviour and if so, how. Accordingly, parents, siblings, teachers, coaches, pop stars and sporting heroes have been studied as role models in several contexts: social learning theories (e.g. Bandura 1977, Jung 1986, Lockwood and Kunda 1997), behavioural studies in and

outside the sport (e.g. Biskup and Pfister 1999, Carr and Weigand 2001, Vescio *et al.* 2005, Guiliano *et al.* 2007, Lines 2011), sociology (Fleming *et al.* 2005, Buford May 2009), pedagogy (Bromnick and Swallow 1999) and education (e.g. Nauta and Kokaly 2001).

An interesting finding from Lockwood and Kunda (1997) is that superstars as role models provoke inspiration and self-enhancement when their success seems attainable to the observer, but provoke self-deflation when it seems unattainable. Furthermore, several authors have found that boys are more likely to choose a sportsperson as a role model than girls (e.g. Ewens and Lashuk 1989, Biskup and Pfister 1999, Bromnick and Swallow 1999, Jones and Schumann 2000, Guiliano *et al.* 2007, Lines 2011). Some authors also stress the possible negative effects of heroes as role models (e.g. Hindson *et al.* 1994, Globus 1998, Payne *et al.* 2003, Lines 2011) and how media coverage communicates and amplifies the impact of role models for young people (e.g. French and Pena 1991, Biskup and Pfister 1999, Fleming *et al.* 2005, Lines 2011).

While this generic literature provides insights on the effects of role models under various conditions, remarkably little research has examined the effect of elite athletes as role models on the sports participation or sports development (see Appendix for an overview of studies).

The inspirational function and legacy of elite events

The concept of sustainable mega event effects is a contested one (Girginov and Hills 2008). It has received increasing attention over the past decade, mainly with regard to the sustainability of the Olympic Games and the growing discourse that reflects Olympic Games legacies (Girginov and Hills 2009, Bloyce and Lovett 2012, Bloyce and Smith 2012, Leopkey and Parent 2012, Veal *et al.* 2012). One of the most important changes in the governance of event legacy has been a shift from *ex post* (after the event, reactive) to *ex ante* (before the event, proactive) strategic planning (Bloyce and Lovett 2012, Veal *et al.* 2012). Legacy has become a taken-for-granted norm that has impacted how organizations plan and implement the Olympic Games (Leopkey and Parent 2012). The International Olympic Committee (IOC) developed the Olympic Games Impact (OGI) project, which requires host cities to undertake a comprehensive longitudinal study designed to measure the economic, social and environmental impacts of each Olympic Games through a set of indicators over a period of 12 years and four reports. However, these indicators monitor only broad quantitative developments in the general participation and school sports (Girginov and Hills 2008). The effects are difficult to assess due to their complexity, and there is not a reliable, widely accepted method for doing so despite the potentially testable benefits of hosting a mega event (London East Research Institute 2007, Veal *et al.* 2012).

Most of the evidence in the literature questions whether major sporting events will inevitably have a positive impact on levels of mass participation (Coalter 2007, EdComs 2007, Girginov and Hills 2008, Veal *et al.* 2012). Only a few studies show positive effects, and these are predominantly on short-term (see Appendix). For example, Hanstad and Skille (2010) report there was a short-term effect after the Sydney 2000 Olympic Games and the Lillehammer 1994 Winter Olympics. Also, Frawley and Cush (2011) and Veal *et al.* (2012) find there was an accelerated growth of the number of rugby players in Australia two years after the World Cup of 2003.

Overall, it can be concluded that there is still a limited evidence of the trickle-down effects of elite success, elite athletes and elite events and that it is especially difficult to claim cause and effect. Existing studies illustrate the complexity of the possible effects or non-effects. The current paper focuses on the inspirational function of elite performances, and in

particular it examines the relationship between membership figures and success. The paper adds to the existing knowledge by comparing different sports within one region (Flanders, the northern, Dutch-speaking part of Belgium), while attempting to determine whether changes in participation rates are the result of an international trend (using data from the Netherlands).

Methods

Data collection

Registered membership figures from the governing bodies of 20 sports were used as a measure of the mass participation rates. These figures were used because reliable non-registered sports participation data are not available on a sport-by-sport and a year-by-year basis and because most elite athletes 'find their roots' in sport through registered sports clubs (van Bottenburg 2003). According to van Bottenburg *et al.* (2005), the advantage of using membership data from sport organizations is that this 'provides insight into the differences between the various branches of sport and it identifies long-term trends' (p. 27). Data on registered membership figures were sought from Bloso, the Flemish sports administration agency, and from national governing bodies when data were missing from the Bloso database. Data over a period of approximately 15 years (starting in 1992), or for the longest period for which data were available, were collected in all 20 Olympic sports that are recognized as elite sports in Flanders and are therefore funded.

To measure longitudinal elite athlete performances (also since 1992) in each of the 20 sports, the research team developed an elite sport index (ESI). This index calculates weighted points for each top eight place for athletes performing at European championships (EC), world championships (WC) and Olympic Games (OG) and some other events for certain sports (e.g. grand slams were used in tennis). Ten points are awarded for a gold medal, 8 for silver, 6 for bronze, 5 for fourth place, 4 for fifth, and so on down to 1 point for eighth.² The researchers gave these events weights of 2 (EC), 4 (WC) and 6 (OG) (De Bosscher *et al.* 2008a). For example, an athlete winning a gold medal at an EC in swimming would be given 16 points (eight points for a gold medal multiplied by a weighting of two). In this way, a total value for each sport is calculated each year. As not all events take place annually, the points of an event in year X are transferred to the next year until a new event of the same kind takes place. As a result, scores for ECs and WCs change every two years and scores for OGs every four years. This is similar to methods used in the UK world-sporting index, the national sporting index developed by Sport Canada and the ESI developed by the Dutch National Olympic Committee* National Sports Federation (NOC*NSF) (De Bosscher *et al.* 2008a).

Data analysis

Pearson correlation coefficients were calculated for each sport to measure the relationship between membership and performances in the ESI for each year. It is assumed that if there is an effect, it does not take place immediately but only in the longer term, and so the study also examined whether success in year X correlated significantly with membership numbers in years (X), (X + 1), (X + 2), (X + 3), (X + 5), (X + 8) and (X + 10). This was only possible when data were available for these years. A significance level of 0.05 was used.

The increase (or decrease) in mass participation was calculated as a percentage change between 2010 and 1992 (or the earliest year where data were available). An increase (or decrease) in mass participation can also be part of an international trend and therefore not indicative of a relationship with international success in a particular country or region (van Bottenburg 2001). If, for instance, Flemish and international membership figures correlate highly, the growth in membership figures after an increase in the success of Flemish athletes may be due to an international trend rather than a local trickle-down effect. Therefore, the changes of membership in Flanders were compared with those in a neighbouring country, the Netherlands. The data for the Netherlands were obtained from the main Dutch sports administration body, NOC*NSF. Using the Infostrada sports database, a comprehensive database of sports statistics and information services, an ESI, similar to the one used in Flanders, was developed in three sports that will be discussed in the results section.

Results

To give a general overview of the most successful sports in Flanders as a starting point, Figure 1 shows the average ESI scores of the 20 recognized Olympic sports in Flanders from 1992 (or the earliest reference year for which data is available) until 2010. As Figure 1 shows, there appears to be no or very limited success in badminton, basketball, handball, fencing, football and volleyball. Therefore, a relationship between the index and membership figures is less relevant in these sports, and so this study did not analyse them in detail. On the other hand, success in judo exceeds the achievements in most other sports, followed by success in cycling, athletics, swimming, equestrian events, tennis, rowing and sailing. If a trickle-down effect exists, these are the sports where such an effect can be expected.

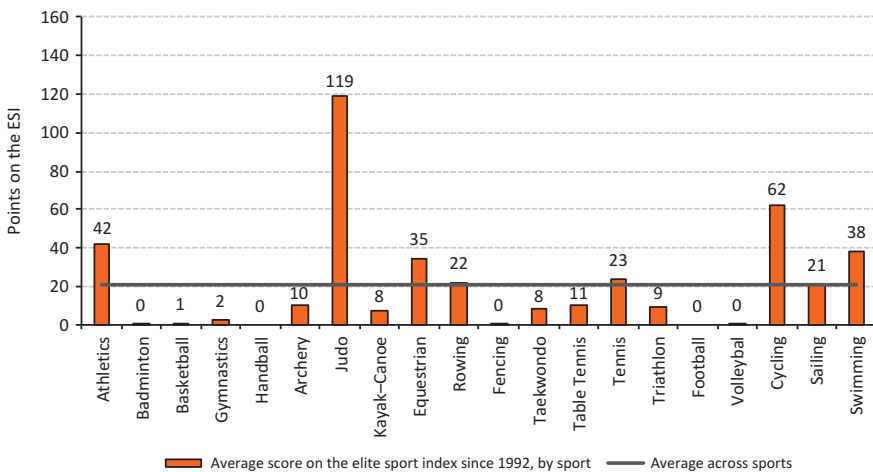


Figure 1. An overview of the total points on the elite sport index (ESI) per sport in Flanders since 1992.

Table 1. Correlation coefficients between success (ESI) in year X and membership in the years $X + 1$, $X + 2$, $X + 3$, $X + 5$, $X + 8$, $X + 10$ in all the sports in Flanders (trickle-down).

	X	$X + 1$	$X + 2$	$X + 3$	$X + 5$	$X + 8$	$X + 10$
Athletics	0.840**	0.736**	0.697**	0.514	0.097	0.198	0.815*
Badminton	no success						
Basketball	no success						
Gymnastics	0.624*	0.467	0.658*	0.821**	0.540	–	–
Handball	no success						
Archery	0.131	0.065	0.096	–0.311	–0.759	0.243	0.537
Judo	0.678**	0.600**	0.529*	0.452	0.386	–0.48	–0.619
Canoe-kayak	–0.766**	–0.777**	–0.743**	–0.527*	–0.197	–0.512	–0.284
Equestrian	–0.097	0.184	0.906**	0.921**	0.892**	0.121	–
Rowing	–0.144	–0.642**	–0.249	–0.005**	–0.084	–0.091	–0.258
Fencing	–0.070	0.482	–0.792*	–0.410	0.033	0.325	–
Taekwondo	–0.089	0.294	0.289	–0.108	–0.683**	0.048	0.623
Table tennis	–0.626*	–0.454	–0.235	–0.191	–0.681**	–0.719*	–0.519
Tennis	0.643**	0.738**	0.812**	0.863**	0.613*	0.187	–0.094
Triathlon	–0.338	–0.080	0.231	0.256	0.186	–0.019	0.147
Football	no success						
Volleyball	no success						
Cycling	–0.282	–0.164	0.092	0.297	0.445	0.654*	0.700*
Sailing	0.396	0.147	0.364	0.692*	0.305	–0.589	–
Swimming	–0.598**	–0.500*	–0.382	–0.278	–0.136	–0.386	0.144

Note: * $p < 0.05$; ** $p < 0.01$.

Correlations between membership figures and ESI scores in 20 sports in Flanders

Table 1 provides an overview of the correlation coefficients between success in year X and membership figures in the years $X + 1$, $X + 2 \dots X + 10$ (trickle-down) for all 20 sports.

Of the 15 sports that have produced successful ESI scores (>0 points) in Flanders, there are only four for which membership figures correlate positively with success (in year X): athletics, gymnastics, judo and tennis. This correlation remains significant two years later ($X + 2$) in athletics and judo, three years later that X in gymnastics and five years later than X in tennis.

Interestingly, in swimming, kayaking and table tennis, the correlation between the membership figures and ESI scores is significant but negative. These correlations decrease after one year for swimming and and three years in kayaking. In table tennis, the correlations fluctuate. In equestrian events, a significant relationship appears only after two years, and in rowing the correlations fluctuate over time. In order to identify common trends in membership figures, the next section compares membership changes over time in Flanders with those in the Netherlands.

Correlations between membership figures in Flanders and the Netherlands (20 sports)

Table 2 presents an overview of the changes in the membership figures in Flanders and the Netherlands and shows the correlation coefficients between the two of them for all 20 sports in this study.

Generally, membership figures increased more in Flanders than in the Netherlands. There are six sports where changes in the membership figures in Flanders and the Netherlands are significantly positively correlated with each other. These are athletics, kayaking, cycling, equestrian events, fencing and triathlon. Among these sports, in

Table 2. Change in membership figures in Flanders and the Netherlands compared to the earliest reference year and the Pearson correlation between both countries.^a

Sport (data available since ...)	FLA	NED	Correlation <i>r</i>
	Change in membership figures since the first point in time		Between FLA and NED
Archery (1996)	-7.2% (status quo)	+26%	-0.065
Athletics (1993)	+100%	+74%	0.949**
Badminton (1996)	+56%	-34%	-0.851**
Basketball (2001) ^b	-4%	-11%	0.065
Cycling (1995)	+166	+25%	0.710**
Equestrian (2002) ^b	+268%	+50%	0.979**
Fencing (since 2002) ^b	+73%	+34%	0.718*
Football (1999)	-6.2% (fluctuating)	+15%	-0.298
Gymnastics (1996)	+140%	-15%	-0.895**
Handball (1992)	+12%	-35%	-0.950**
Judo (1992)	-19%	+7.6% (fluctuating)	0.044
Canoe-kayak (1996)	-5%	-26%	0.724**
Rowing (1996)	+5.0% (status quo)	+26%	0.208
Taekwondo (1996)	+0.4% (status quo)	-5.0% (status quo)	0.028
Table tennis (1992)	+20.6%	-20.8%	-0.923**
Tennis (1992)	+45%	+0.4%	-0.593**
Triathlon (1995)	+115%	+24% (fluctuating)	0.571*
Volleyball (1992)	+15%	-21%	-0.785**
Sailing ^b (2002)	-1% (status quo)	-7%	0.416
Swimming (1992)	+48%	-13%	-0.937**
Average	+51%	+4.7%	

Notes: ^aAs membership figures may fluctuate we present the data as a general trend (which could mean that there can be an exceptional year in the dataset).

^bThere is only a limited data set in these sports.

Flanders, it is only in athletics that membership figures correlate significantly and positively with the ESI scores. Nevertheless, this does not automatically mean that the athletics membership increase in Flanders is part of an international trend, because the Netherlands has also been relatively successful in the elite athletics between 2004 and 2006.

Interestingly, membership figures in Flanders and the Netherlands are significantly negatively correlated in seven sports. These sports are badminton, handball, gymnastics, swimming, table tennis, tennis and volleyball. In all these sports, the Flemish situation is marked by a significant increase in membership while membership figures have stabilized or decreased in the Netherlands. Notably, membership figures decreased in gymnastics, swimming and volleyball in the Netherlands despite the Dutch successes in these sports and despite the increases in membership in Flanders during the same period. Gymnastics membership figures are striking, with a 140% increase in Flanders compared to a 15% decrease in the Netherlands, despite significant Dutch successes since 2001. No or limited successes were shown in the two countries in handball and badminton, although membership patterns differed. What should be noted is that membership numbers are generally higher in the Netherlands, that has a population 2.6 times higher than Flanders. This is relevant because it is easier to double a small number of members than a large number. Despite there being nine times more handball players in the Netherlands, the country has so far been unable to produce notable international success.

The correlations described above do not enable us to draw any conclusions because they do not provide information about the direction of the correlation or how success and membership changed over time. There is no indication, for example, whether significant correlations are associated with increases or decreases in membership and success figures. To illustrate this point, the evolution of the membership and success figures will be presented graphically in the next section. For the purpose of this paper, three sports with significant correlations were selected. One of them has a significant positive correlation because of increased membership and success figures over time (athletics); one has a significant negative correlation because of increased membership figures and decreased success (swimming) and one has a significant positive correlation because of decreases in both the membership and success figures (judo). These three sports will be compared with the Netherlands to identify possible common trends in membership change and changes in success. Finally, a sport with decreased membership figures and increased success was not available in Flanders but was in the Netherlands (swimming).

An analysis of membership figures and ESI scores in three top-performing sports

Athletics

Figure 2 and Table 1 show that both membership figures and scores on the ESI increased over time in Flanders. Successful ESI scores correlate significantly with the membership figures ($r = 0.840, p < 0.01$) until two years later ($X + 2$, see Table 1). Athletics is one of the sports where Flanders has been most successful since 2001, including a high-jump gold medal from Tia Hellebaut and a silver medal in the 4×100 relay³ at the Beijing 2008 Olympics. It should be noted that the athletes concerned received much media attention and were used for marketing purposes by several commercial enterprises. Membership figures reached a peak in 2006 and scores on the ESI reached a peak in 2008 (Figure 2).

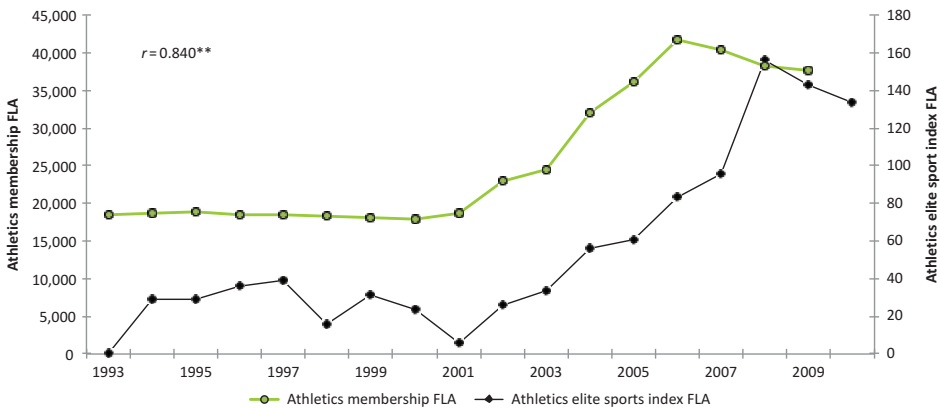


Figure 2. Membership figures and points on the elite sport index in ATHLETICS in Flanders.

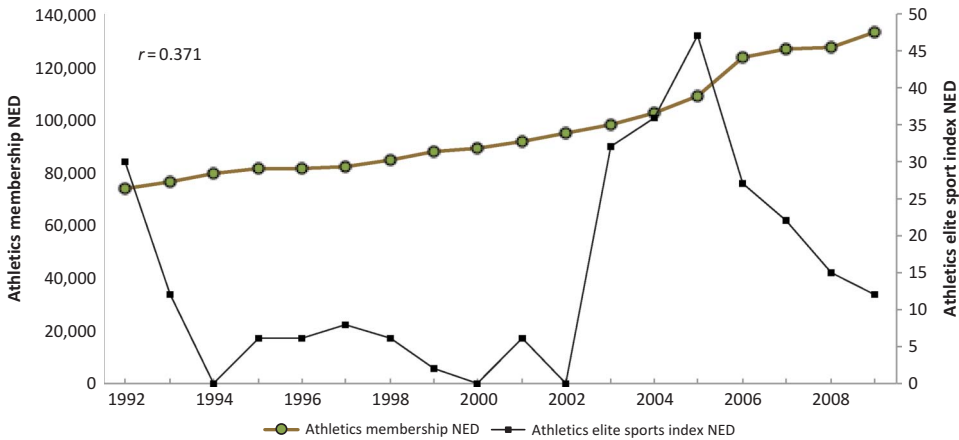


Figure 3. Membership figures and points on the elite sport index in ATHLETICS in the Netherlands since 1993.

Membership figures in the Netherlands (Figure 3) show a continuous increase from 1993 to 2009 (by a total of 74%). These figures are highly correlated with the Flemish membership figures ($r = 0.949, p < 0.01$). It could, therefore, be assumed that increased membership figures in athletics may be an international trend. However, the Netherlands also have some successes in athletics, especially between 2004 and 2006, with a gold and silver medal at the WC in Helsinki (2005) and at the EC in Gothenburg (2006) (Figure 3).

Judo

Judo is characterized by a decrease in total membership figures and in success figures since 1992 (Figure 4). Judo has been Flanders’ most successful sport since 1992, with a peak in 1996–1997 after four medals in the 1996 Atlanta Olympics and four in the ECs that followed (Figure 1). Until 2003, Flemish judo competitors consistently performed well. Meanwhile,

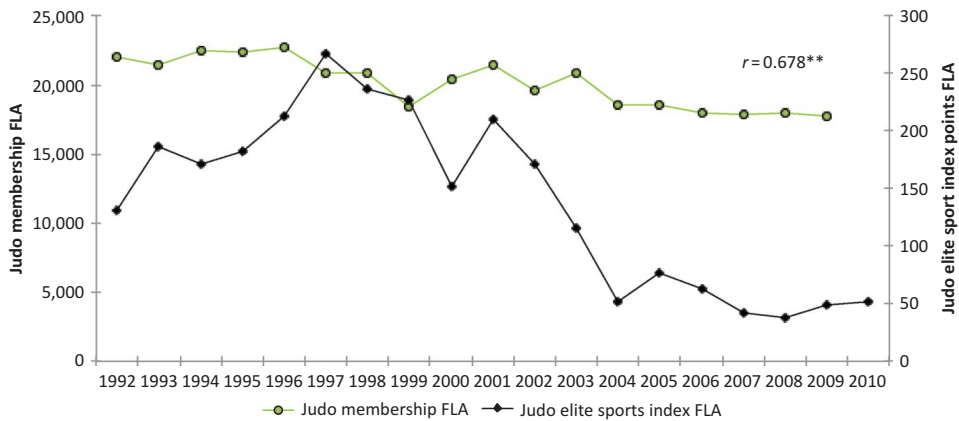


Figure 4. Membership figures and points on the elite sport index in JUDO in Flanders.

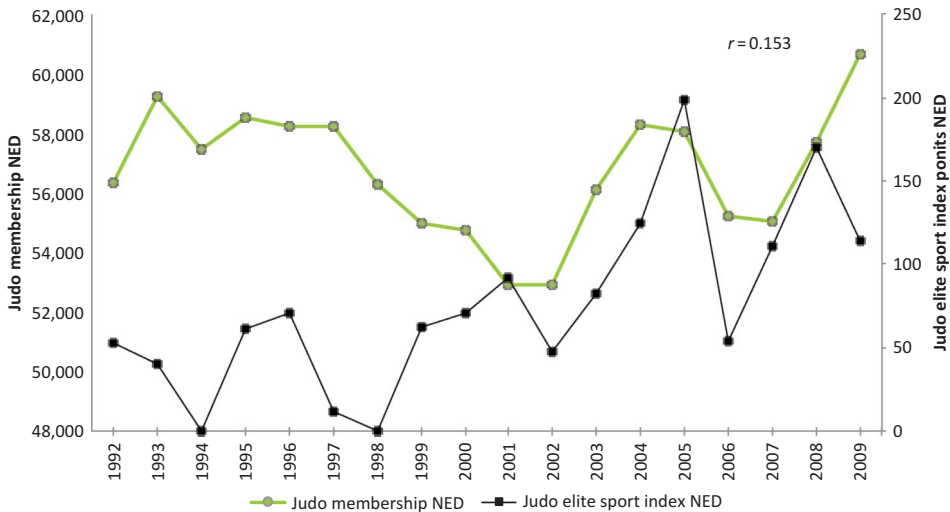


Figure 5. Membership figures and points on the elite sport index in JUDO in the Netherlands since 1992.

following the peak performances in 1996 and 1997, there has been no notable increase in the membership figures except for the period 1999–2001. Overall membership decreased by 19% from 1992 to 2009. After 2003, the points on the ESI also decreased. In sum, success in judo is positively correlated with membership figures over the past 15 years ($r = 0.678$, $p < 0.01$).

In the Netherlands, it was found that membership figures fluctuated (Figure 5). Analysis of results from major international tournaments reveals that several Dutch athletes also won medals at WCs and OGs with a peak in 2005, when Dutch athletes won five gold medals at ECs and WCs. The correlation between the membership figures and success is not significant. Furthermore, there is no significant correlation between the membership figures in the Netherlands and in Flanders.

Swimming

The most successful year for Flemish swimming performances was 1996 with gold going to Fred De Burghgraeve at the Atlanta Olympics. After this period, medal wins decreased considerably, down to zero in 2007. Despite the lack of success, membership figures have increased continuously since 1996 (Figure 6). The total increase of membership since 1992 is 48% (Table 2). The correlation between the success and membership figures is significant but negative ($r = -0.598$, $p < 0.01$).

What is most interesting in swimming is that the membership figures in the Netherlands have continuously decreased (total decrease 13%), as is shown in Figure 7, despite the repeated successes of the Dutch athletes since 1996. This is confirmed by the negative correlation ($r = -0.575$, $p < 0.01$). The correlation between the Flemish and Dutch membership figures is -0.937 ($p < 0.01$) (Table 2).

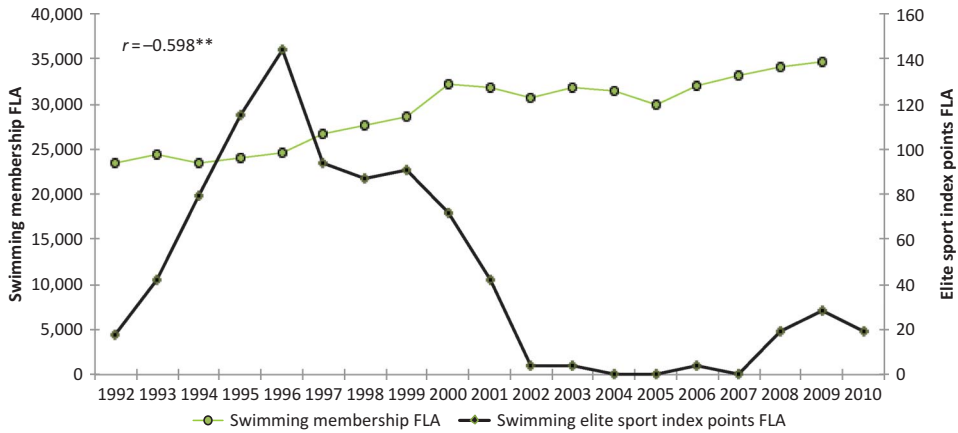


Figure 6. Membership figures and points on the elite sport index in SWIMMING in Flanders.

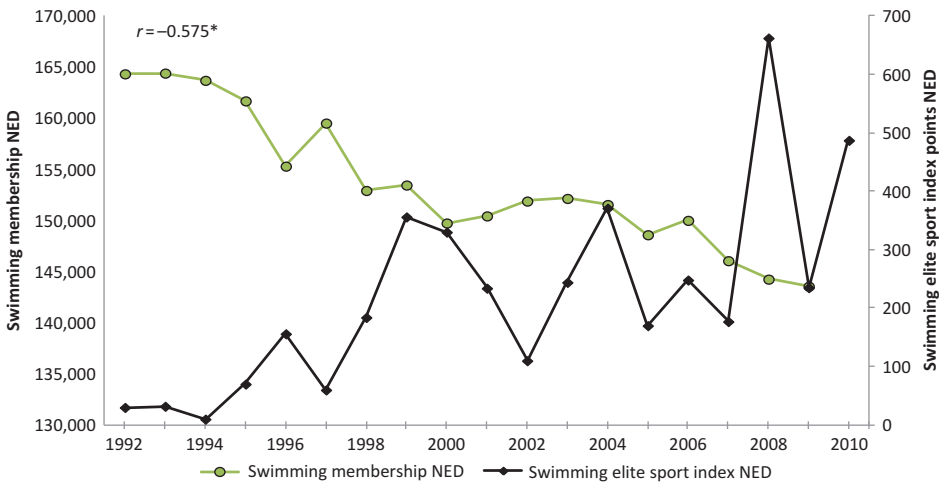


Figure 7. Membership figures and points on the elite sport index in SWIMMING in the Netherlands since 1992.

Discussion

This paper explored the relationship between the elite sport and mass participation. This was achieved by examining the existing literature and analysing a particular aspect of the relationship between the elite and mass participation sport: the statistical connection between elite performances and mass participation (expressed as membership figures), using Flanders as a case. This study represents a one-sided (statistical) contribution to the literature and explores *whether* there is a relationship between the two variables. The study does not provide answers to questions about *why* and *how* this relationship occurs or about what mechanisms are associated with participation changes, nor does the study offer any evidence about possible indirect influences such as media coverage, sponsorship, sport facilities, strategies or programmes for mass participation.

The basic rationale of the study was *if* success correlates significantly with membership figures, one can assume there is a trickle-down effect of success that leads to more registered members. Accordingly, the study also assumes that *if* this relationship exists it may not take place immediately – it could take place one, two, or even eight or ten years after this success. The analysis of 20 sports in Flanders did not provide clear evidence to support the existence of a trickle-down effect. The study showed that it is difficult to discern any general trends. This is an interesting finding because it contradicts the many claims made in policy documents and proves that the subject needs to be further explored before the trickle-down effect can be accepted as true. This result is not unexpected given earlier contradictory research findings in smaller-scale studies (e.g. van Bottenburg 2001, 2002, De Bosscher and De Knop 2003, Elphinston 2004, Stewart and Nicholson 2004, Feddersen *et al.* 2009, Hanstad and Skille 2010, De Bosscher and van Bottenburg 2011). Significant positive correlations in Flanders were only found in four of the eight sports that have achieved successful ESI scores over the past 15 years (i.e. athletics, gymnastics, judo and tennis). In athletics, the significant correlation between the Flemish and Dutch membership figures suggests that there was an international trend. However, Dutch competitors have also been successful in some major athletics championships.

Athletics, gymnastics, judo and tennis are all highly internationalized sports, as indicated by the number of countries at international competitions. They are among the top 10 most popular organized sports in the world (van Bottenburg 2001). In the other four successful Flemish sports (equestrian events, sailing, rowing and archery), no significant correlations were found (note however that the data for equestrian events and sailing were limited). These sports are characterized by less organized participation structures and worldwide they are practised in an organized context by less than one million people per sport (van Bottenburg 2001). This finding lends weight to the hypothesis that ‘it is more likely that there will be a relationship between mass participation and elite performance in a popular sport than in a less popular sport’. On the other hand, three negative correlations were also striking, in Flemish table tennis, swimming and kayaking, where memberships decreased despite international successes. Also, in the Netherlands, the membership decreased in swimming and gymnastics, despite major wins by the elite Dutch athletes in these sports. In conclusion, these findings show that caution must be exercised about the sweeping statements that are often made about the sport pyramid model.

However, some limitations in the Flemish data may have hindered our contribution to resolving the original research question on the relationship between the elite sport and mass participation. First, there was only a limited data set available in Flanders (for the past 15 years only). Second, as the analysis used membership figures to identify effects on sports participation in an organized context only, effects on the broader sports participation including non-registered memberships (e.g. outside of club systems, such as in schools and universities, and through commercial providers) have not been identified. This may be significant in some sports given the popularity of projects like start-to-run or start-to-swim in Flanders. Therefore, the membership figures reflect participation mainly in a competitive setting, and according to van Bottenburg *et al.* (2005), they offer a limited view of reality. Third, Flanders’ success in international sports is generally limited (De Bosscher *et al.* 2011), which may reduce the chances of finding any significant relationships. Therefore, an extension of the analysis is needed at an international level on a sport-by-sport basis. For example, in their analysis of data from 43 countries, De Bosscher and De Knop (2003) found that the number of tennis players and the number of courts correlated significantly with national success at the international level for both males and females. The absence of more studies of this kind is related to the lack of available comparable data, either across sports to

identify specific clusters, or across countries to identify international trends. This paper should therefore encourage international cooperation to enable a deeper scrutiny of this subject. Finally, as the figures in the three sports discussed in this paper showed, a success can fluctuate much from one year to the next.

In conclusion, the findings for Flanders remain fragmented and do not show clear evidence of a relationship between the elite sport and mass participation. This is by itself an interesting finding. It shows that a relationship is far from obvious, despite the general assumptions made by policy makers and by the public that a demonstration effect exists. It also shows that even if an effect is present, it may not manifest in an increase in the number of registered sport members. Hence, this study offers an answer to the question *if* a relationship can be found, in one region and for 20 sports. This represents a first step toward further and deeper analysis.

There are several variables influencing a possible relationship between elite success and mass participation. These variables need to be taken into account in order to understand how and why elite success and mass participation are related.

First, media coverage of athletes and sport disciplines is inherently linked to this relationship (e.g. van Bottenburg 2003, Fleming *et al.* 2005, Sotiriadou and Shilbury 2009, Hanstad and Skille 2010, Lines 2011). Sports with higher media coverage may be more likely to be taken up by the community. This is a virtuous cycle because the outstanding performances attract media attention. This was the case with tennis in Flanders following the performances of Kim Clijsters at the beginning of the twenty-first century (Schouteden and De Bosscher 2005). On the other hand, it could also be the case that sports with high media ratings in Flanders like football and cycling do not need international success to receive newspaper and television coverage.

Second, if elite achievements generate mass participation, this does not happen automatically. Specific organizations, programmes, competitions and facilities are required (van Bottenburg 2002, Sotiriadou *et al.* 2008, Hanstad and Skille 2010) and as indicated by Girginov and Hills (2008), Olympic legacies need to be constructed, as they do not happen spontaneously. In this respect, the effects of elite success on participation may be influenced by actions taken by national governing bodies to use role models in sport promotions, to design and implement various programmes that aim to foster this effect and to offer incentives to increase memberships or to increase sport facilities and access to sport venues. The Flemish tennis federation is a typical example. The federation launched country-wide projects in schools at a time when major successes in tennis were taking place, and it increasingly professionalized its service delivery to tennis clubs (Goethals 2004).

Finally, there are many other elements that complicate the quest for more in-depth insights into the relationship between a success and participation. For example, does elite sport success inspire sports participation in the same sports, or does it inspire sport participation in general? Does the inspirational function of elite athlete success stay within a country or does it have effects abroad? If a young sports person had not been inspired to participate because of elite athlete success or by an elite athlete role model, would they have participated in another sport? It is possible that the trickle-down effect does not influence non-sporting people to take up a sport, but rather causes already active sportspersons to change sports, as was found in Weed's (2009) study of rugby and cricket. Similarly, a recent survey of elite athletes in Flanders revealed that only 10% of the respondents ($n = 112$) indicated that former elite athletes motivated them to take up their sport. However, 63% indicated that elite athletes inspired them to train more intensively (De Croock *et al.* 2012). It could therefore be useful to analyse trickle-down effects at different stages of the sport development process in further research – for example at the athlete entrance, retention, transition and advancement/

nurturing stages (Green 2005, Sotiriadou *et al.* 2008). Accordingly, further analysis of the Flemish data used in this paper revealed that when taking only competition members into account in swimming,⁴ the correlation between ESI scores and mass participation increased significantly from to -0.598 to $+0.565$ ($p < 0.05$). This may also be related to the specific character of swimming, where many young children take swimming courses (e.g. for safety reasons) without any intention to continue the sport. Specific membership figures on youth and competition members would enrich the data analysis.

While the evidence presented here is not adequate to assess the validity of the claims made by policy makers that the elite sport and mass participation benefit one another, this paper sheds further light on the complexity of this relationship. As indicated by some authors, the key questions are not whether success, role models or events stimulate a short-term participation, but whether engagement is maintained and whether elite athletes have the power to boost the aspirations of those already involved, or to inspire talented people to train more frequently (e.g. Green 2005, Sotiriadou and Shilbury 2009, Grix and Carmichael 2012). Furthermore, there are many other determinants of a mass participation. As stated by Houlihan and Green (2011), in reality common facilitators for physical activity are not medals or elite athletes but enjoyment and social interaction. Therefore, the trickle-down effect is not by itself sufficient to increase the participation.

This research confirms the many policy discourses around the trickle-down effect, and it shows that what is taken-for-granted by policy makers cannot be verified by sound statistical evidence on the membership figures. Prudence is therefore required in policy documents and in the arguments used to underpin political decisions about how to spend the public money. National sport organizations and policy institutions should be aware that a possible trickle-down effect is not a self-evident phenomenon that automatically flows from success, elite athletes or events. Even if a predisposition for the trickle-down effect does exist, it will only become a reality if it is included in a strategic plan and promoted through active programmes. So far, researchers have not succeeded in finding convincing evidence of a relationship between elite success and mass participation sport, or in developing a sound research method to adequately measure the possible relationship between the two. In the meantime, policy documents in many countries keep referring to the pyramid metaphor to justify their spending on elite sport, often to the detriment of funding to support the mass participation. Remarkably, little interest has been paid to researching the subject by the policy makers and international organizations. As countries worldwide are compelled, or feel compelled, to increase their elite sport investments in order to maintain or improve their performance at the Olympics, a better understanding of the impact of these investments on mass participation is crucial for answering the question of what it costs to be part of this game (De Bosscher *et al.* 2008b).

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Notes

1. Green (2005) formulated a normative theory for sport development, divided over three stages of athletes' careers: athlete recruitment, athlete retention and athlete advancement. Green discusses the factors that hinder and stimulate athletes during these stages. Sotiriadou *et al.* (2008) provide an organizational perspective on the elite sport development at three different stages, referring to this as the ARTN (attraction, retention/transition and nurturing) model. The authors illustrate the generic processes and strategies that are described by national governing bodies (NSOs in Australia). They conclude that the pyramid needs to be scrutinized more. Note that four stages were distinguished in this paper instead of three because (in a European context) progressing to higher levels of competition is distinguished from talent development.
2. There are no top eight places in four sports: badminton, taekwondo, table tennis and tennis. In these sports, the total available points were calculated as 10 points for the winner, 8 points for being a losing finalist, 5.5 points for reaching a semi-final and 2.5 points for reaching a quarter-final. This system of calculation was adopted from the Dutch sports administration NOC*NSF (<http://www.sport.nl>).
3. Note that the silver medal in Beijing in the 4 × 100 m relay was won by three Flemish runners (Kim Gevaert, Elodie Quédraogo, Hanna Mariün) and one Walloon athlete (Olivia Borlée).
4. No such data are available for the other sports in Flanders.

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Appendix. A selective overview of (empirical) studies on the three facets of the relationship between elite and mass participation

Authors	Source	Methods	Conclusion
(a) <i>The inspirational function of elite performances for sports participation</i>			
Hanstad and Skille (2010)	Journal article	Document analysis, correlations (Pearson's r) and 21 interviews with the federation and athletes in biathlon	Positive correlation between registered athletes and (a) Olympic/world championship medals and (b) top 15 places
Fedderson <i>et al.</i> (2009)	Working paper	DD analysis (divergence-in-difference), effect of German tennis boom related to membership figures	No positive effects of 'success interventions'; decline in tennis membership figures after 1990
Weed (2009)	Research policy report	Effects of success of the national teams in rugby and cricket ($n = 1509$), using SPEAR model and links to motivation model	Mixed effects: positive only for people (32%) already engaged in sport, for lapsed participants to re-engage (35%) and for activity switching
Mori (2004)	Research policy report	Quantitative questionnaire with managers of ice rinks ($n = 16$) & curling clubs, $n = 295$ (50%) & interviews	Participation increase, related to television coverage of 2002 curling teams and success; greatest influence on those who were already active in sport
Steward and Nicholson (2004)	Conference paper	Correlation membership figures and success (OG, WK, Commonwealth) six sports over 14-year period	No clear relation between success and organized sport participation (e.g. swimming, cycling, soccer); varies per sport
van Bottenburg (2003)	Book	Trends in participation and success in Dutch sports; a comparison of German versus Dutch tennis, volleyball.	Inconsistent findings: in German versus Dutch tennis and in Dutch volleyball after success 1992 & 1996; negative effects in skating, hockey and football; positive in judo and darts.
van Bottenburg (2001, 2002)	Conference papers	Correlations participation-success overall sports in 20 countries; relation with broadcasting time (NED)	Positive correlation at the overall sports level only in an organize sports context and higher if sport is practised more frequently and intensive
De Bosscher and De Knop (2003)	Conference paper	Correlation and regression analysis with tennis success (ATP and WTA rankings) and (a) registered tennis members 43 European countries (b) tennis courts	Positive significant correlation with tennis members ($r = 0.749$) and courts (0.858); adjusted R Square: 38.2% of the total registered members explained by tennis success
Hogan and Norton (2000)	Journal article	Elite sport spending Australia 1976–1995 is compared with medal tally and number of sedentary population	No positive effects; while increasing success and elite sport spending an increased sedentary adult population, as well as overweight or obesity

- (b) *The inspirational function of elite athletes (sport stars as personalities): role model effects in relation to sport participation*
 Braeckmans *et al.* (2005) Masters thesis Role models effects, opinion survey with 229 young talents from the elite sport schools in Flanders
 Vescio *et al.* (2005) Journal article Role models effects, quantitative and qualitative data from two focus group interviews and a survey ($n = 357$)
 Payne *et al.* (2003) Research report Literature review (95 articles) and 15 interviews with sport and recreation organizations that offer role model programmes
- (c) *The inspirational function of elite events in relation to sport participation*
 Veal *et al.* (2012) Journal article Secondary analysis of national survey data on three events
 Chen and Henry (2012) Conference paper Realist evaluation approach in a non-hosting region of London 2012, Leicestershire; survey with inhabitants
 Frawley and Cush (2011) Journal article 2003 Rugby World Cup: membership changes and 7 interviews afterwards with senior managers
 DCMS (2012)^a Research policy report Meta-evaluation of the outputs, outcomes, impacts, benefits of investment in the legacy of the 2012 Games
 Virginov and Hills (2008) Journal article Process oriented approach on Olympic legacies (five conceptual elements), in two case studies: the EVA (English Volleyball Association) and Street Games
 Hindson *et al.* (1994) Journal article Questionnaire: 1992 Olympics (Albertville & Barcelona) effects on club membership in New Zealand

Note: ^aThornton in collaboration with Ecorys and Loughborough University developed a comprehensive and systematic meta-evaluation of the impacts and legacy of the London 2012 Olympic Games. Results are only expected by the end of 2013.

(b) *The inspirational function of elite athletes (sport stars as personalities): role model effects in relation to sport participation*

Small effects: only 14% of respondents were inspired by an elite athlete

Small effects, especially for girls, only 8.4% perceived a sports person as role model; characteristics: female, age < 40, similar sporting background masculine/feminine qualities (such as being kind, modest, caring and fair)
 Ample theoretical evidence; only two organizations evaluated their programmes; role models are not always positive (e.g. negative social images)

Inconsistent findings: mixed results on Sydney OG (only 4% had changed their participation; positive on adults); positive after 2003 Rugby World Cup; no evidence of 2006 Melbourne Commonwealth Games

Positive effects: the region's inhabitants were more aware of the benefits of taking part in sport and physical activity; and their overall amounts of sport and physical activity had increased

Positive trend: increase participation, side/indirect effects related to programmes, increased resources and staff, increased exposure, identification

To be continued: the results of the post-games initial evaluation will take place between June 2012 and March 2013

Contestable Legacy Discourse – Olympic legacy needs to be constructed (not given). A national policy and long-term investment strategy, project management is required to affect sustainable sports participation

Limited effect on club membership in the six sports; related to the lack of marketing and promotion in sports clubs;