

Running head: Elite sport and mass participation

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

Abstract

Many governments use the trickle-down or demonstration effect to justify their high investments in elite sport. The assumption is that elite athlete 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 analyze 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 the figures in Netherlands to identify common trends. Analysis across 20 sports revealed no consistent relationship between membership 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 elite sport using the argument that elite athlete success and hosting international events generate numerous positive outcomes. These benefits include improved national identity, pride, international prestige and diplomatic recognition, individual development of talented people and the capacity to inspire increased mass participation in sport (Houlihan and Green 2008, van Bottenburg, Elling, Hover, Brinkhof and Romijn 2011, Wicker, Hallmann, Breuer and Feiler 2012). However, there is inadequate evidence to support these claims, which are described as *storylines* by Fischer (2003 cited in Houlihan, Bloyce and Smith 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.

Because such outcomes of elite sport are assumed to be self-evident, no further evidence appears to be required for governments to justify their high investments in the production of medal winning capability (Grix and Garmichael 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, Grix and Garmichael 2012, Leopkey and Parent 2012, Department for Culture, Media and Sport 2012).

The question of why nations should care about winning medals, and therefore why they should invest in elite sport, remains unanswered. In this regard, also the elevated status of elite

sport remains uncritically accepted (Coalter 2007). The unproven relationship between elite success and mass participation leads to increasing tensions in political priorities, between investing in elite sport for a small group of athletes or developing a wide range of organisations and facilities for mass participation users (van Bottenburg 2003, Houlihan and Green 2008).

The aim of this paper is to examine the relationship between elite and mass participation in Flanders, the Dutch-speaking region of Belgium. In particular, this paper investigates one facet of the trickle-down effect by analyzing the statistical relationship between international sporting success and membership figures in 20 sports. Accordingly, the research question is ‘What is the association between international sporting success and mass participation membership figures?’ Subsequent questions concerned with understanding how, under what circumstances and why there is a relationship, lie beyond the scope of this paper.

The sport pyramid metaphor

The relationship between 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, elite and mass participation sports have been seen as interrelated and mutually dependent. In many sports a large base of mass participation numbers is perceived to provide a positive breeding ground for elite sport. In turn, elite sport is regarded as attracting young children to sports because of the inspirational function of elite athletes and the attention given to of 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, Shilbury and Quick 2008, Grix and Carmichael 2012). This pyramid metaphor has been criticised because many people practice a sport without any desire to ascend to a higher level (Eichberg and Henning 1998). In addition, 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 development in a mass participation structure and an elite sport approach (Eichberg and Henning 1998). Elite and mass participation sports continue to grow apart and the connection between them is placed under increasing strain. This divergence puts pressure on public policies that use this pyramid metaphor to legitimise their investments in either one of these areas (De Bosscher, Bingham, Shibli, van Bottenburg and De Knop 2008).

The search for evidence: the trickle-down effect

The argument that elite athletes have the power to inspire young people rests on 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 a factor of:

- 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 these functions can be further examined in relation to four areas:

- a) The effects on participation in sport. These effects can be examined at the attraction (or the recruitment of new participants), the retention (or the motivation and engagement to continue with the sport), the advancement or transition (to move up towards a higher levels of competition) and nurturing stage of sport participation (the increased commitment and dedication for the sport to move onwards to the elite level) (see Sotiriadou et al. 2008 and Green 2005 for more details¹);

- b) The effects on the choice of sport;
- c) The effects on behavior within the sport (e.g. the choice for a certain position in a team; the inspiration to copy techniques, tactics or possibly malpractices); and
- d) The effects on behavior outside the sport (e.g. clothing, hair style, music preferences, general values such as drugs, sex, racism).

Following this division, appendix A provides an overview of a number of these studies. It shows research is limited often to the so-called ‘grey’ literature (e.g. conference papers, in-house papers) (Grix and Carmichael 2012). The examination of the relationship between 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 change in availability of sport infrastructure and an activity-friendly neighborhood (Wicker et al. 2012), peers, school, activities organised by sport organisations to attract young people or even increases in income or the Gross Domestic Product. Because of this complicated nature of the trickle-down effect, the available research has not yet succeeded in finding clear evidence of elite success on mass participation. The next section will continue to discuss this for the three independent factors.

The inspirational function of elite performances

Some studies that explore the relationship between elite athletes’ performances and mass participation mostly belong to the grey literature in the policy and management fields (see appendix A). Most of these studies use correlation or regression analyses to explore the relationship between membership figures and elite success, mostly within one sport. These studies provide varying results. For example, various researchers identified counter-effects in some sports that have been successful over time or have had outstanding athletes but mass participation rates have decreased (e.g. Stockvis and Minee 1986, Van Bottenburg 2003, Steward and Nicholson 2004, Green 2005, Feddersen, Jacobsen and Maennig 2009). This was,

for instance, the case with tennis in Germany following Boris Becker's and Steffi Graf'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 mass participation (measured as the number of registered athletes) and Olympic Games/world championship medals ($r=.597$; $p < .05$) and top fifteen places ($r=.690$; $p < .05$) in cross-country skiing and shooting in Norway. A study from De Bosscher and De Knop (2003) revealed 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 organised sports context and the number of medals per million inhabitants in 20 European nations ($r=.535$; $p < .01$). Interestingly, this correlation increased when intensity and competitiveness increased.

When considered collectively, the above studies suggest that there is no clear evidence of an effect, nor of a non-effect and that if a relationship exists, it may be sport, country and context specific. Weed (2009), in his study with 1509 rugby and cricket participants in New Zealand, concluded that the demonstration effect as a consequence of elite success did not have a significant impact on those who rarely or never participated and are therefore not already emotionally engaged with the sport. It did, however, impact those already engaged with sport in three ways: it encouraged a re-engagement of lapsed participants, it brought about an increase in participation frequency among current participants and it resulted in the switching of participation between activities among current participants. 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 remain therefore 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 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 primarily originates from the sport psychology research, either in the context of individuals of outstanding achievement (e.g. Lockwood and Kunda 1997) or as people who have qualities we would like to have (e.g. Guiliano, Turner, Lundquist and Knight 2007). This literature offers insights on what role models young people choose, why they choose them, and whether and how' young people's behaviour can be influenced. Accordingly, parents, siblings, teachers/coaches, music/pop stars and sporting heroes have been studied as role models in the context of social learning theories (e.g. Bandura 1977, Jung 1986, Lockwood and Kunda, 1997), behavioural studies in and outside sport (e.g. Biskup and Pfister 1999, Carr and Weigand 2001, Vescio, Wilde and Crosswhite 2005, Guiliano et al. 2007, Lines 2011), sociology (Fleming, Hardman, Jones and Sheridan 2005, Buford May 2009), pedagogy (Bromnick and Swallow 1999) or education (e.g. Nauta and Kokaly 2001).

An interesting finding from Lockwood and Kunda (1997) was 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 found that boys are more likely to choose a sport's person as a role model than girls (e.g. Ewens and Lashuk 1989, Biskup and Pfister 1999, Bromnick and Swallow 1999, Jones and Schuman

2000, Guiliano et al. 2007, Lines 2011). Some authors also stressed the possible negative effects of heroes as role models (e.g. Hindson, Gidlow and Peebles 1994, Globus 1998, Payne, Reynolds, Brown and Fleming 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 deeper insights on the role model function and its conditions, remarkably little research has examined the effect of elite athletes as role models specifically on sports participation or sports development (see Appendix A for an overview of studies).

The inspirational function and legacy of elite events

The concept of sustainable mega event effects is a controversial and contested one (Girginov and Hills 2008). It received an increasing interest over the past decade mainly with regard to the sustainability of the Olympic Games and the growing discourse on legacies (Girginov and Hills 2009, Bloyce and Lovett 2012, Leopkey and Parent 2012, Veal, Toohey and Frawley 2012). One of the most important evolutions in the governance of event legacy has been a shift from *ex post* (after the Games, reactive) to *ex ante* (before the Games, proactive) strategic planning (Bloyce and Lovett 2012, Veal et al. 2012). Legacy has become a taken-for-granted norm that has impacted how organisations plan and implement the Olympic Games (Leopkey and Parent 2012). The 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 impact of the Olympic Games through a set of indicators over a period of 12 years and four reports. However, those indicators rather vaguely capture only quantitative developments in general participation and school sports (Girginov and Hills 2008). The effects are complex to assess and there is a lack of a trustworthy 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 literature contests whether major sporting events have an inevitable positive impact on the levels of mass participation (Coalter 2007, EdComs 2007, Girginov and Hills 2008, Veal et al. 2012). Only a few studies show positive effects that are predominantly short-term (see appendix A). For example, Hanstad and Skille (2010) noted a short-term effect after the Sydney 2000 Olympic Games and the Lillehammer 1994 Olympic Games. Also, Frawley and Cush (2011) and Veal et al. (2012) indicated an accelerated growth of the number of rugby players in Australia two years after organizing the World Cup of 2003.

Overall, it can be concluded that there is still limited evidence of the trickle-down effect through 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 on 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 identify if the effects is the result of an international trend (using data from the Netherlands).

Methods

Data collection

Registered membership figures from national governing bodies from 20 sports were used as a measure of mass participation. 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, Rijnen and van Sterkenburg (2005) the benefit

of using membership data from sport organisations is that it ‘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 was missing from the Bloso database. Data over a period of approximately 15 years (starting in 1992), or for the longest period for which data was available, were collected in all 20 Olympic sports that are recognised as elite sport 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 (10 points for gold, 8 for silver, 6 for bronze and respectively five to one for the athletes ranked places four to eight ²) of 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). These events were weighted with 2 (EC), 4 (WC) and 6 (OG) points respectively, according to their relative importance (De Bosscher, De Knop and Truyens 2008). For example, the performance of an athlete winning a gold medal at an EC in swimming would raise the index by 16 points (two weighted points for the event multiplied by eight points for a gold medal). As such a total value 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 similar event 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 in the Netherlands developed by the Dutch sports administration National Olympic Committee* National Sports Federation (NOC*NSF) (De Bosscher et al. 2008).

Data analysis

Pearson correlation coefficients were calculated for each sport to measure the relationship between membership and performances in the ESI at each year. As it may be assumed that a possible effect does not take place immediately but only in the longer term 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 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 Dutch membership figures correlate highly, the growth in membership figures after increasing success in Flanders may be explained by an international trend rather than by success in Flanders. 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 Infostrada sports database, a comprehensive database of sports statistics and information services to which the authors had gained access, an ESI, similar to Flanders, was developed in three sports that will be discussed in the results section. Popi: you deleted: “making use of the Infostrada sports database, a provider of comprehensive sports statistics and information services to which the authors had gained access” – but the question might raise (1) why didn't we do this immediately (because we had no access to this; creating the ESI in Flanders was a full time one year study – that we can now do much faster with infostrada (2) and why not for all 20 sports and calculation correlations; this would be a research again by itself (it took me already a full day to calculate it just for the 5 sports);

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 recognised sports in Flanders from 1992 (or the earliest reference year 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 this study did not analyze 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.

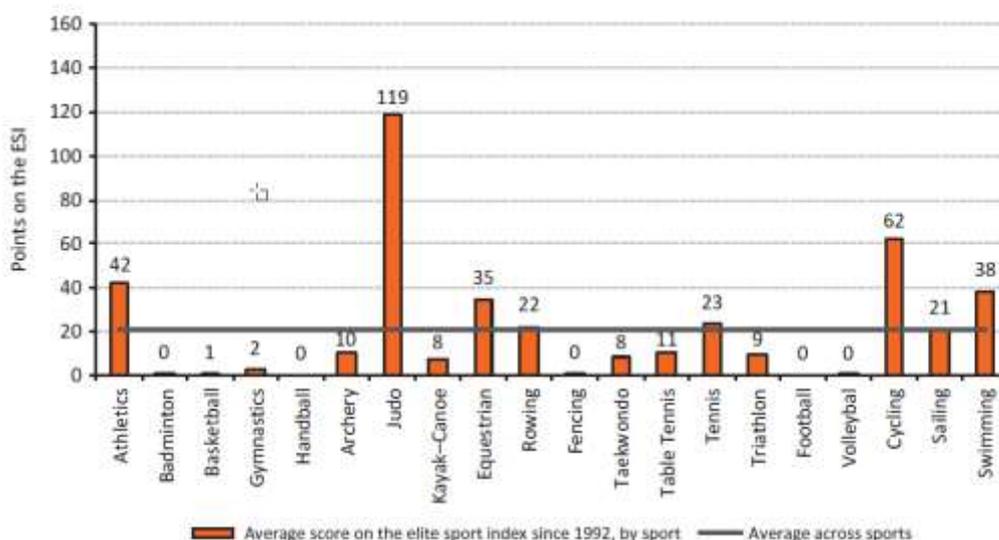


Figure 1. An overview of the total points on the elite sport index (ESI) per sport in Flanders since 1992.

Popi, what changed below:

- Below: I have moved tables 1 and 2 to the beginning instead of the end; as you can see, this table by itself (=your suggestion) is not very informative and does not sufficiently show the point we want to make; it is just a correlation, nothing more: e.g. a positive correlation can be an increase of memberships and success (as in athletics) but also a decrease (as in judo); these are two totally different findings, having a

similar correlation; the interesting part is in these selected sports, where we now select 3; the reason why is explained in the text (The reviewer did not say we ‘have to’ stick with one sport; the reviewer suggested it as one of the ways to reduce the paper (which we did in many other ways); we do not go against this reviewer)

A correlation 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+ 1-10 (trickle-down) for all 20 sports.

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



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, tennis. This correlation remains significant two years later (X+2) in athletics and judo, three years in gymnastics and five years in tennis.

Interestingly, in swimming, canoe and table tennis the correlation between membership figures and ESI scores in Flanders is significant but negative. These correlations decrease after respectively one and three years and fluctuate in table tennis.

In equestrian a significant relationship appears only after two years and in rowing the correlations are fluctuating over time, so are the membership figures and success figures.

In order to identify common trends in membership figures, the next part 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 change in membership figures in Flanders and the Netherlands and the correlation coefficients between the two of them for all 20 sports in this study.

Sport (data available since . . .)	FLA	NED	Correlation r
	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.

Generally, membership figures increased more in Flanders than in the Netherlands. There are six sports where membership figures in both Flanders and the Netherlands are significantly positively correlated with each other. These are athletics, canoe-kayaking, cycling, equestrian, fencing and triathlon. From these sports, in Flanders it is only in athletics that membership

figures correlate significantly and positively with 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 elite athletics over the past 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 notable increase in membership figures while membership figures have stabilised or decreased in the Netherlands. Notably, membership figures decreased in gymnastics, swimming and volleyball in the Netherlands despite the relatively high 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 lower number of members than a higher number. Despite there being nine times more members in handball in the Netherlands, the country has not been able so far to produce notable international success.

Thus far correlations were not very conclusive because they do not provide information about the direction of the correlation or how success/membership changeover time. They do not show for example whether the correlation is significant because of an increase or decrease in membership and success figures. To illustrate this point, the evolution of the membership and success figures will be visualized graphically in the next section. For the purpose of this paper a selection of three sports with significant correlations was made: one sport with a significant

positive correlation because of increased membership and success figures over time (athletics); one sport with a significant negative correlation because of increased membership figures and decreased success (swimming) and finally one sport with a significant positive correlation because of both decreased 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 2A and Table 1 show that both membership figures and scores on the ESI increased over time in Flanders. Successful ESI scores correlate significantly with memberships ($r=.840$, $p<.01$) and this 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 4x100 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 2A).

Membership figures in the Netherlands (Figure 2B) show a continuous increase since 1993 (by 74%). They are highly correlated with the Flemish membership figures ($r=.949$, $p<.01$). It could, therefore, be assumed that increased membership figures in athletics may be an international trend. However, the Netherlands had also have some fluctuating 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 2B).

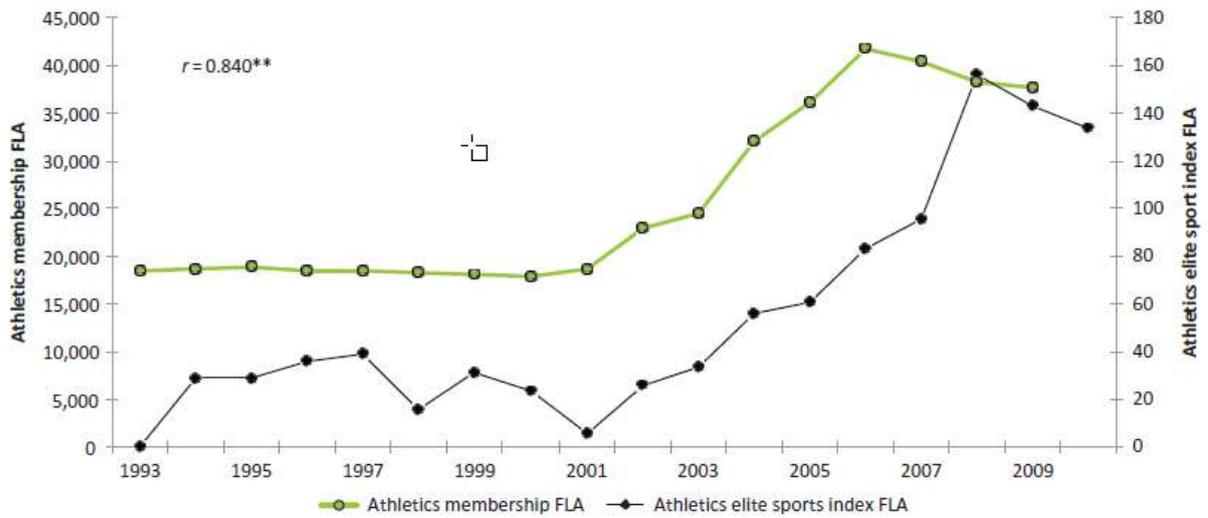


Figure 2. Membership figures and points on the elite sport index in ATHLETICS in Flanders.

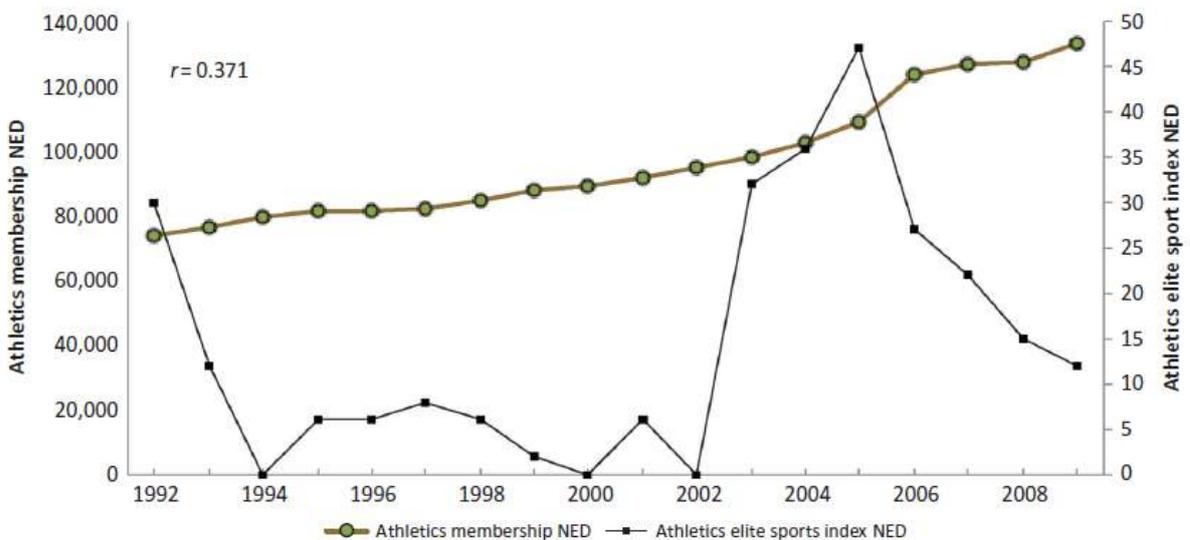


Figure 3. Membership figures and points on the elite sport index in ATHLETICS in the Netherlands since 1993.

Judo

Judo is characterized by a total decrease of membership figures and success figures since 1992 (Figure 3A). 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, following the peak performances in 1996-1997, there has been no notable increase in membership figures except for the period 1999-2001. A total decrease of -19% is notable since 1992. 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 ($r=.678$, $p<.01$).

In the Netherlands, it was found that membership figures fluctuated (Figure 3B). Analysis of results from major international tournaments reveals that several Dutch athletes also won medals at WCs and OGs since 1992 with a peak in 2005, a year with five gold medal wins of Dutch athletes at ECs and WCs. The correlation between membership figures and success is not significant. Furthermore there is no significant correlation between membership in the Netherlands and in Flanders.

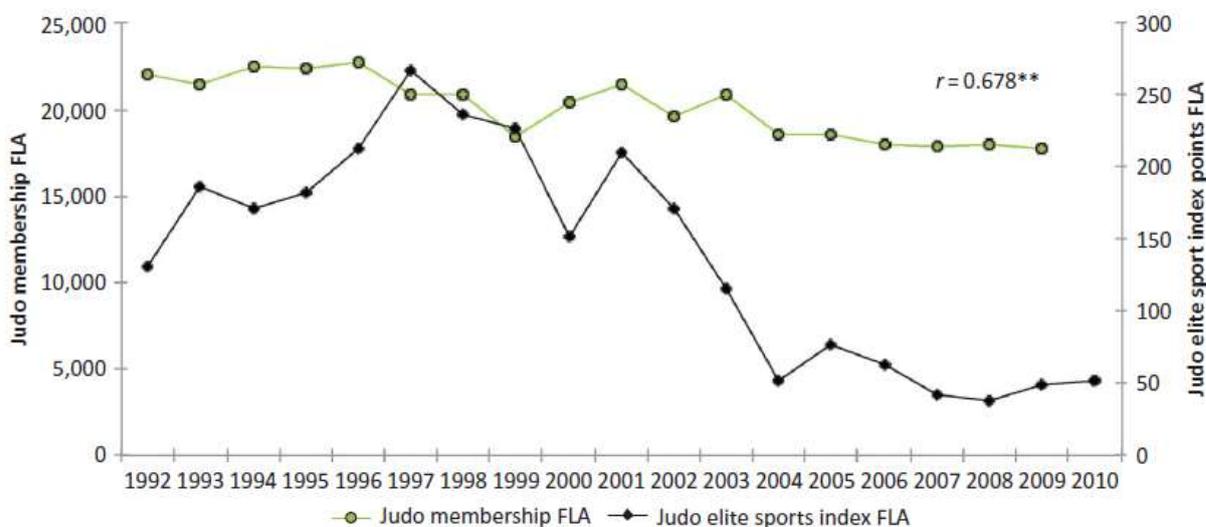


Figure 4. Membership figures and points on the elite sport index in JUDO in Flanders.

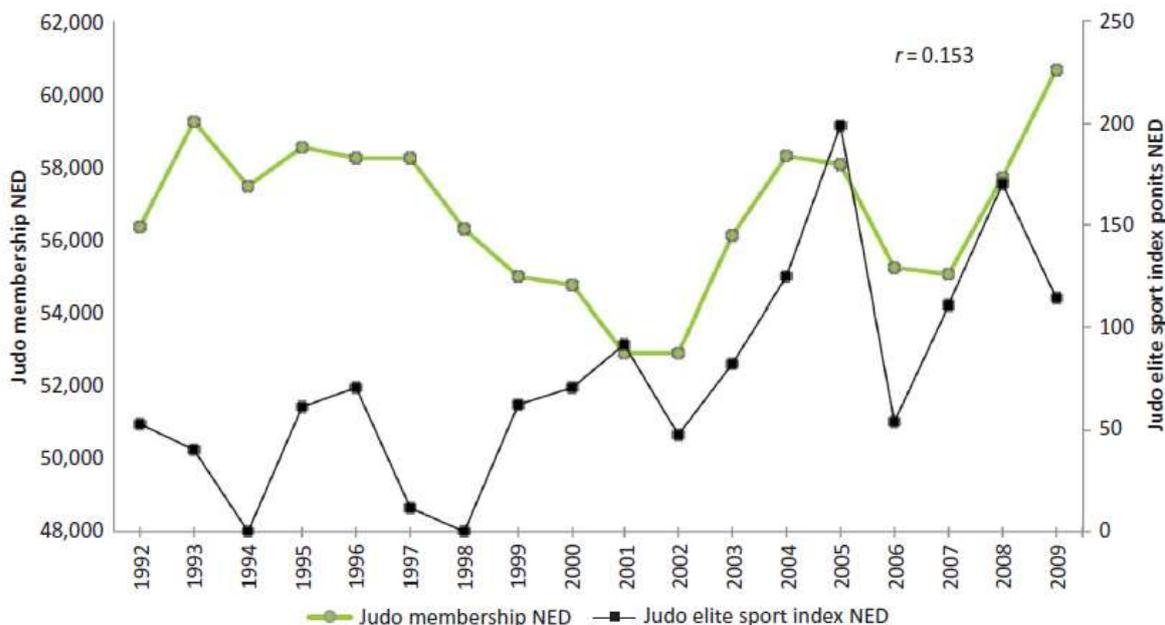


Figure 5. Membership figures and points on the elite sport index in JUDO in the Netherlands since 1992.

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 4A). The total increase of membership since 1992 is +48% (Table 2). The correlation between success and membership figures is significant but negative ($r = -.598$, $p < .01$).

What is most interesting in swimming is that membership figures in the Netherlands have continuously decreased (total decrease -13%), as is shown in Figure 4B, despite the repeated successes of the Dutch athletes since 1996. This is confirmed by the negative correlation ($r = -.575$, $p < .01$). The correlation between Flemish and Dutch membership figures is $-.937$ ($p < .01$) (Table 2).

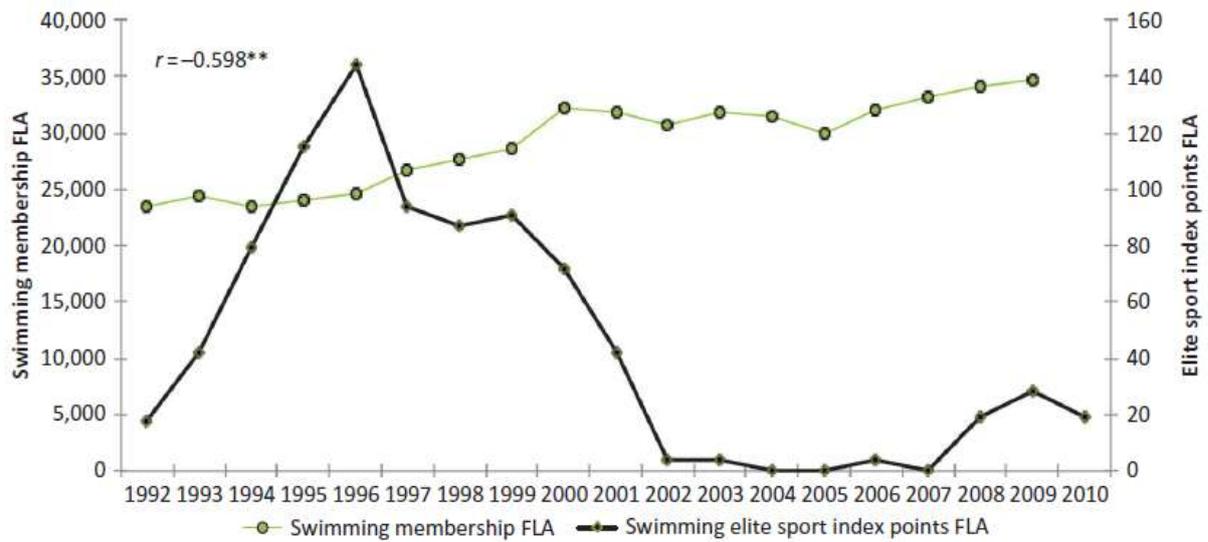


Figure 6. Membership figures and points on the elite sport index in SWIMMING in Flanders.

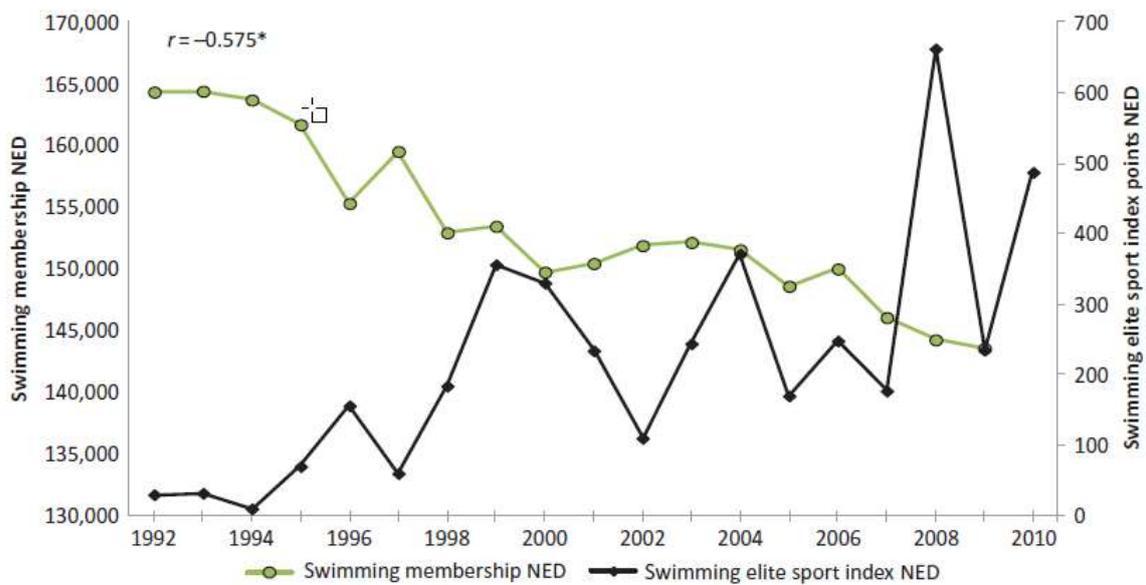


Figure 7. Membership figures and points on the elite sport index in SWIMMING in the Netherlands since 1992.

Discussion

This paper explores the relationship between elite sport and mass participation. This was done by framing the existing literature and analysing a particular element of the relationship between 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 that explores *if* 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 assumption of the study was that: “if” success correlates significantly with membership figures, one could assume that there may be a possible trickle-down effect of success, that leads to more registered members. Accordingly the study also assumes that “if” this relationship would not take place immediately, it could take place one, two, ... eight or ten years later after this success. The analysis of 20 sports in Flanders did not provide clear evidence. The study showed that it is difficult to discern 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 it can be used as an accepted truth. 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 achieved successful ESI scores over the past 15 years (i.e. athletics, gymnastics, judo and tennis). In athletics, the significant correlation between 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 significantly internationalised as indicated by the number of countries at international competitions. They are among the top ten most popular organised 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 was limited). These sports are characterised by less organised participation structures and worldwide they are practiced in an organised context by less than one million people per sport (van Bottenburg 2001). This finding lends weight to the hypothesis that ‘it is more likely for widespread, popularized sports with a high number of organized sports participants to find a mutual relationship between mass participation and elite performance than for smaller, less popularized sports’. On the other hand, three negative correlations were also striking, in Flemish table tennis, swimming and canoeing, where memberships decreased despite international successes. Also, in the Netherlands membership decreased in swimming and gymnastics, despite the major wins by elite Dutch athletes. In conclusion, these findings show that caution must be exercised about the sweeping statements that are often made about the sport pyramid relationship.

However, some limitations in the Flemish data may have hindered our contribution to resolving the original research questions on the relationship between elite sport and mass participation. First, there was only a limited data set available in Flanders (over the past 15 years only). Second, as the analysis used membership figures to identify effects on sports participation in an organised context only, effects on the broader sports participation including non-registered memberships (e.g. outside of the club system, such as in school/university, and through commercial providers) have not been identified. This may be significant in some sports given the hype of start-to-run or start-to-swim projects among Flemish population. Therefore, membership figures reflect participation mainly in a competitive setting and offer according to van Bottenburg et al. (2005) a limited view of reality. Third, Flanders’ success in international sports is generally limited (De Bosscher, Shilbury, Van Hoecke, Theeboom and De Knop 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, De

Bosscher and De Knop (2003) found in their analysis of data from 43 countries 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 article 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, success can fluctuate much from one year to another. In conclusion, the findings in Flanders remain fragmented and do not show clear evidence of a relationship between elite sport and mass participation. This by itself is interesting. It shows that a relationship is not obvious, despite the general assumptions made by policy makers and the public opinion in general that a demonstration effect appears. It also shows that –even if an effect would be created, the number of registered sport members will not evidence it. Hence, this study offers an answer to the *if* question in one region and for 20 sports. This represents a first step towards further and deeper analysis. There are several variables influencing a possible relationship between elite and mass participation. These variables would need to be taken into account in order to understand how and why this relationship is shaped.

First, media coverage of athletes and sport disciplines is inherently linked to this (e.g. Lines 2001, van Bottenburg 2003, Fleming et al. 2005, Sotiriadou and Shilbury 2009, Hanstad and Skille 2010). Sports with higher media coverage may be more likely to be taken up by the community. This is a vicious circle because outstanding performances attract media attention. This was the case with tennis in Flanders following the performances of Kim Clijsters at the beginning of the 21st 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 to international success to receive newspaper and television coverage.

Second, if elite achievements generate mass participation, this does not happen automatically. Specific organisations, programs, 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 are not given. In this respect, the effects of elite success on participation may be influenced by actions taken by NGBs to use role models in sport promotions, to design and implement various programmes and to offer incentives to increase memberships or to increase sport facilities and access to sport venues. The tennis federation in Flanders is a typical example. They launched country-wide projects in schools at a time when major successes in tennis were taking place, and increasingly professionalised their 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 success and participation. For example, does elite sport success inspire sports participation in the same sports, or sport participation in general? Does the inspiring 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 sports persons 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, De Bosscher and van Bottenburg 2012). It could therefore be useful to analyze 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 swimming⁴ the correlation between ESI scores and mass participation increased significantly from to $-.598$ to $+.565$ ($p < .05$). 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 from currently available data presented here is not adequate to assess the validity of the claims made by policy makers that elite sport and mass participation benefit one another, this article confirms the complexity of the issue. As indicated by some authors, the key question is not whether success, role models or events stimulate 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 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 demonstration effect in and of itself is not sufficient to increase participation.

This research confirms the many policy discourses around trickle-down effects and shows that what is taken for granted by policy makers cannot be confirmed by sound statistical evidence on membership figures. Prudence is therefore required in policy documents and the arguments used to underpin political priorities with public money. National sport organizations and policy institutions should be aware that a possible trickle-down effect is not a self-evident phenomenon that originates automatically from success, elite athletes or events. If it exists, it needs to be included in a strategic plan and constructed by 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 connection. 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 mass participation. Remarkably little interest has been paid to the subject by policy makers and international organisations. 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. 2008).

Footnotes

¹ Green (2005) formulated a normative theory for sport development, divided over three stages: athlete recruitment, athlete retention and athlete advancement and discusses the factors that hinder and stimulate athletes during these stages. Sotiriadou et al. (2008) provided an organisational perspective on elite sport development at three different stages, referring to this as the ARTN model: Attraction, retention/transition and nurturing process. 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 scrutinised more. Note that four stages were distinguished in this paper instead of three because (in a European context) moving up the 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 a final, 5,5 points for a half final and 2,5 points for a quart final. This point calculation was adopted from the Dutch sports administration NOC*NSF (<http://www.sport.nl>)

³ note that the silver medal in Beijing on the 4x100m relay was won by 3 Flemish (Kim Gevaert, Élodie Quédraogo, Hanna Mariën) and 1 Walloon athlete (Olivia Borlée)

⁴ no such data are available in the other sports in Flanders

⁵ Thornton 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

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

Authors	Source	Methods	Conclusion
<i>(a) 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 fifteen places
Feddersen, Jacobsen and Maennig 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 and 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 practiced 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
<i>(b) The inspirational function of elite athletes (sport stars as personalities): role model effects in relation to sport participation</i>			
Braeckmans and De Bosscher 2005	Masters thesis	Role models effects, opinion survey with 229 young talents from the elite sport schools in Flanders	Small effects: only 14% of respondents were inspired by an elite athlete

Vescio, Wilde, and Crosswhite, 2005	Journal article	Role models effects, quantitative and qualitative data from two focus group interviews and a survey (n = 357)	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)
Payne, Reynolds and Fleming 2003	Research report	Literature review (95 articles) and 15 interviews with sport and recreation organisations that offer role model programs	Ample theoretical evidence; only two organizations evaluated their programs; role models are not always positive (e.g. negative social images)
<i>(c) The inspirational function of elite events in relation to sport participation</i>			
Veal, Toohey, and Frawley 2012	Journal Article	Secondary analysis of national survey data on 3 events	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
Chen and Henry 2012	Conference paper	Realist evaluation approach in a non-hosting region of London 2012, Leicestershire; survey with inhabitants	Positive effects: t 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
Frawley and Cush 2011	Journal Article	2003 Rugby World cup: membership changes and 7 interviews afterwards with senior managers	Positive trend: increase participation; side/indirect effects related to programs, increased resources and staff, increased exposure, identification
DCMS 2012 ⁵	Research policy report	Meta-evaluation of the outputs, outcomes, impacts, benefits of investment in the legacy of the 2012 Games	To be continued: the results of the post-games initial evaluation will take place between June 2012 and March 2013
Virginov and Hills 2008	Journal article	Process oriented approach on Olympic legacies (5 conceptual elements), in 2 case studies: the EVA (English Volleyball Association) and Street Games	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
Hindson, Gidlow and Peoples 1994	Journal article	Questionnaire: 1992 Olympics (Albertville & Barcelona) effects on club membership in New Zealand	Limited effect on club membership in the six sports; related to the lack of marketing and promotion in sports clubs;