INTRODUCTION

At the 15th IAAF World Championships in Beijing, European countries won the highest number of medals (49 medals in total). However, the old continent, still considered to be the home of athletics, also loses ground in disciplines it has dominated for decades. For example, men's javelin has been an event dominated by Europeans. In 2012, Keshorn Walcott became the youngest Olympic Javelin champion ever while Julius Yego won gold at the 15th IAAF World Championships in Beijing. A discipline that once was monopolised by Europeans has been internationalised very rapidly since 2008. It can be expected that three non-European athletes (cfr. Egyptian Ihab Abdelrahman, Trinidad and Tobago athlete Keshorn Walcott and Kenyan Julius Yego) will be throwing for gold at the Rio Olympics. This exemplifies the dynamic internationalisation in elite athletics: individual countries win or lose their market position to other competing countries.

National successes, the outcome of the competition between countries, tend to differ. While many countries participate in Olympic Games or world championships, – in the 2012 Olympic Games athletes from no less than 204 countries were present – success tends to be concentrated. For example, the US team topped the London Olympic medal table winning over 11% of medals. This is in large contrast to 119 countries not winning any medal at all. The 'global sporting arms race' (Oakley & Green, 2001; De Bosscher et al., 2008) describes the growing investment and institutionalisation of elite sport leading to the intensification of international competition (De Bosscher et al., 2008; Green & Houlihan, 2005; Houlihan & Green, 2008). Policy makers believe that by strategically investing in elite sport, they can improve their countries' chances at success. As a results, different studies identified the internationalisation of elite sport during the last two decades (De Bosscher, Dubois & Heyndels, 2012; Shibli, Bingham & Henry, 2007). However, due to the increasing competitiveness, countries' medal opportunities have changed accordingly. Originally, Hogan and Norton (2000) found a linear relationship between money spent and the total number of medals won by Australia between 1976 and 1998. More recently, De Bosscher et al. (2008, 2015) and van Bottenburg (2009) indicated that countries were experiencing a diminishing return on investment: merely investing more money does not automatically lead to more success.

How elite sport policies affect international sporting success has been a popular subject of international research over the past decade. Multiple researchers suggested frameworks which refer to common approaches and characteristics in elite sport development (e.g., Bergsgard, Houlihan, Mangset, Nødland, & Rommetveldt, 2007; De Bosscher, De Knop, van Bottenburg, & Shibli, 2006; Digel, Burk, & Fahrner, 2006; Green & Houlihan, 2005; Oakley & Green, 2001). Oakley and Green (2001) identified ten characteristics of elite sport policy which represent a common approach to elite sport development. Green and Houlihan (2005), Houlihan and Green (2008) and Digel et al. (2006) provided descriptive comparisons of national elite sport policies among countries and sports which confirmed the international convergence in elite sport systems (Houlihan, 2009). Across multiple countries, there exists a general model of elite sport development with slight variations between countries (Houlihan & Green, 2008).

In 2006, an international research consortium, SPLISS (Sport policy factors Leading to International Sporting Success) developed a nine-pillar model on elite sport policy (De Bosscher et al., 2006). The purpose of the model was to model the relationship between elite sport policies and international sporting success. Based on a comprehensive body of literature on the organisational context of countries in elite sport and two experimental studies, 144 critical success factors were grouped within the nine pillars of the model. CSFs describe a process or activity that is required for ensuring the success of a company or an organisation. The nine pillars of the SPLISS model are: (1) financial support, (2) structure and organisation of elite sport policies, (3) foundation and participation, (4) talent identification and development, (5) athlete career support, (6) training facilities, (7) coaching provisions and development, (8) international competition and (9) scientific research.

Since 2006, the SPLISS model has remained one of the most comprehensive and popular models for elite sport development in elite sport literature (Andersen, Houlihan & Ronglan, 2015). Different from most descriptive and contextual studies on elite sport, the SPLISS research includes a specific mixed methods methodology whereby a standardised sport policy inventory is combined with an elite sport climate survey with elite athletes, elite coaches and performance directors. As such, the model and the methodology provide a clear insight into the relationship between pillars, CSFs and success. The results of the SPLISS study is, in addition to a descriptive qualitative analysis, a scoring system with

scores for CSFs and the nine pillars of the model. These scores are based on qualitative and quantitative indicators. As such, the method allows for the measurement of the competitive position of countries in relation to other sample nations (De Bosscher, Shibli, van Bottenburg, De Knop & Truyens, 2010). A major conclusion of these studies was that there is no generic blueprint - no sets of pillars, critical success factors or recognised best practices that can be transferred into any national context with the guarantee of delivering success. There is broad consensus on the ingredients that go into the elite success recipe but countries combine ingredients in their own unique ways (De Bosscher et al., 2015, p.390).

Most sport policy research represented models including the same key dimensions of elite sport development such as talent identification, well-developed and specific training facilities and competitive competition programs (Houlihan, 2009). This trend is described as the 'homogenisation of elite sport policies' (Oakley & Green, 2001). Elite sport policy research represented minimal research on the level of heterogeneity in elite sport policies (Sotiriadou, Gowthorp, & De Bosscher, 2013), even though Digel et al. (2006), De Bosscher et al. (2009) and Green and Houlihan (2008) had conceptualised sport systems as variations of pillars or popular characteristics in elite sport development. While researchers agreed that the policies of different nations are converging into uniform models, there is room for diversity among national elite sport policies.

Andersen and Ronglan (2012) pointed out that trends towards convergence could go hand in hand with an increasing divergence. They concluded that increased convergence on a general level is flanked with remarkable and growing divergence between Nordic elite sport systems. Even within a highly competitive domain of elite sport, there is considerable space for local ingenuity. In 2009, Böhlke and Robinson stated that "even though it is generally agreed what services should be provided by an elite sport system, little is known about how sport systems should manage their elite services" (p.70). De Bosscher, van Bottenburg, Shibli and De Knop (2013) raised a comparable reflection. They stated that "despite the growing investment in elite sport systems, the optimum strategy for delivering international sporting success is still unclear" (p.47). In conclusion, it could be stated that there is a lack of studies that focus on the actual organisation and management of modern elite sport practices (Andersen & Ronglan, 2012).

A need for sport specific research

Even though elite sport policy has been researched in different international studies, some important scientific and methodological challenges remain unanswered. Only a small amount of research has focused on the organisation of elite sport policies or the combination of these sport policy factors at a sport-specific level (Böhlke & Robinson, 2009; De Bosscher, 2007; Oakley & Green, 2001; Sotiriadou & Shilbury, 2009; Sport Industry Research Centre, 2002; Winand, Rihoux, Qualizza, & Zintz, 2012). Success of countries is concentrated in specific sports. 'There is no country with a competitive advantage in the Olympics. Rather countries have a competitive advantage in individual sports or more specifically individual events within these sports' (SIRC 2002, p. 120). There is less knowledge about the key determinants of success at sport-specific level, as there is a lack of international comparative research in one specific sport.

Recent studies which focus on policies or elite sport practices at a sport-specific level include studies which analysed the governance of the sport and NGBs' general organisational performance (cfr. Green and Houlihan, 2008; Grix, 2009; Grix and Parker, 2011), the specific organisational practices in sport federations (Böhlke, 2007), the growing divergence in the organisation of elite sports among different sports and countries (Andersen and Ronglan, 2012; Newland and Kellett, 2012; Phillips and Newland, 2014) or the importance of contextual or cultural factors in the development of elite sport (Brouwers, Sotiriadou and De Bosscher, 2015; Sotiriadou, Gowthorp and De Bosscher, 2013). Complementary to these studies, a growing body of research examines the organisational capacity of specific sport organisations like National Olympic Committees (NOCs), national governing bodies (NGBs) or clubs (e.g., Madella Bayle, & Tome, 2005; Robinson & Minikin, 2011, 2012; Wicker & Breuer, 2011; Winand, Rihoux, Qualizza, & Zintz, 2011).

The current state of literature requires new perspectives on how countries develop a strategy to improve organisational capacity and to obtain a competitive position at a sport-specific level. Different authors suggested the need for an approach at organisational level which elucidates how decisive factors to the development of success are interrelated or managed in specific contexts (Andersen & Ronglan, 2012). To correspond to this need, the purpose of this study is to identify how nations develop a competitive advantage in athletics. A market-based view (MBV) and a resource-based view (RBV) have

been applied to evaluate countries competitive position. The industry or market-based view (MBV) approach suggests that superior returns are a function of the industry and thereby determine the conduct and performance of organisations (Oliver, 1997). It explains an organisation's performance as being largely determined by the market structure of the industry in which the organisation operates. A competitive strategy of an organisation is based on the understanding of the structure of the industry and its competitive position. Therefore, in a first paper, the trends in competitive balance in athletics were identified. A longitudinal and cross-sectional analysis contrasted men's and women's competition and the eight different disciplines between 2000 and 2015.

In three following papers, a model to evaluate countries' organisational capacity in athletics is developed and tested in a four country comparison according to the RBV. This perspective states that countries build organisational capacity by the development and configuration of organisational resources (Grant, 2010; Wernerfelt, 1984). As such, the RBV is perceived as on 'inside-out' perspective (Spanos & Lioukas, 2001; Teece et al., 2007). These internal characteristics are heterogeneous organisational resources and capabilities that are the source or the possibility to create above normal rates that in turn can lead to a sustainable competitive advantage (Oliver, 1997). Organisational resources are defined as "all assets, capabilities, organisational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive and implement strategies that improve its efficiency and effectiveness" (Barney, 1991, p.101). Resources are physical, human, or organisational assets (Barney, 1991; Bar-Eli, Galily & Israeli, 2008). A capability refers to the capacity of organisations to combine and organise resources, usually in combination with tacit elements (such as knowledge and expertise) embedded in the processes (Amit & Schoemaker 1993). Additionally, first-order capabilities represent a combination of resources. Higher-order or core capabilities are bundles of first-order capabilities (Wang & Ahmed, 2007). As organisations represent heterogeneous collections of resources and capabilities, resources have different levels of efficiency, as some are superior to others (Peteraf, 1993).

Knowledge on the determinants of elite sport development at a sport specific level would provide the opportunity to evaluate countries' organisational capacity within this specific sport. In international research, the organisational capacity of sport organisations like clubs, NGBs or NOCs has been evaluated (i.e. Madella, Bayle & Tome, 2005; Robinson & Minikin, 2011, 2012; Wicker & Breuer, 2011; Winand et al., 2011). Until now, a method to evaluate the organisational capacity of countries to obtain a competitive position within a specific sport has been nonexistent. Additionally, current studies fail to identify and evaluate sport practices leading to international success in a country-by-country comparison. Such an international comparison among competitors is crucial to understand how countries can develop a competitive advantage or improve their organisational capacity (Rangone, 1997).

By addressing the research limitations in elite sport research as listed above, the purpose of this paper is to identify how nations develop a competitive advantage in athletics. A competitive advantage refers to the ability gained through attributes and resources to perform at a higher level than others in the same industry or market (Chaharbaghi & Lynch, 1999). As such, a competitive advantage is a relative concept which is only meaningful when compared to other countries. More than only one country in a given market or industry can have a competitive advantage (Fahy, 2000). In this study, reference is made to the organisational capacity of countries to explain their competitive position, rather than their absolute level of international sporting success (i.e. number of medals or top 8 places).

Competitive balance in elite athletics

The concept of competitive balance has been subject of theoretical development and practical application among many sports, especially in American professional team sports (e.g. Maxcy & Mondello, 2006; Zimbalist, 1992) and European football or soccer (e.g. Goossens, 2006; Montes, Sala-Garrido & Usai, 2014; Szymanksi, 2003). The main issue of competitive balance is that different opponents are of equal ability such that the outcome of competition or championship is uncertain (Sanderson, 2002). A competition among competitors with a high degree of variation in their level of sporting success is considered to have a lower degree of competitive balance. As a result, the success will be for the significant stronger opponent and the uncertainty surrounding of the outcome is threatened (Owen, 2013). In case of perfect competitive balance, every team or participant would have an equal chance of winning.

To measure the level and evolution of competitive balance, a longitudinal and cross-sectional analysis was applied to athletics to measure the evolution of competitive balance and the differences between athletics disciplines. Competitive balance for each competition is measured through a series of widely used indicators, each capturing the concentration of success among countries: (a) the concentration ratio 4 (CR4), (b) coefficient of variation (CV), (c) Hirschman-Herfindahl index (HHI) and (d) proportion of medal winning countries (PMW) and top-8 winning countries (PT8). Medal and top-8 market shares will be applied at a general level (including all 46 or 47 events), while only top-8 market shares will be discussed at a discipline specific level.

First, evidence of static and dynamic changes in competitive balance were identified between 2000 and 2015. According to the CR4 top 8, both men's and women's competition were more dominated by the top performing countries. At the level of specific disciplines, divergent trends in competitive balance were found. In 2015, men's competition was more dominated in middle distance running, throwing events and relays, but more competitive in sprint/hurdles, long distance running and jumping events. In women's competition, competitive balance decreased in all disciplines, except jumping events. The top 8 market share of the best four countries grew to 97.22% in long distance running and 73.33% for sprint/hurdles.

Second, the subset of countries obtaining large market shares in these disciplines shifted. Compared to 2000, individual countries lost their market share as new countries became more successful. For example, in 2015, 77% of the top 8 market share in women's middle distance running and 69% of the market share in sprint/hurdles was won by countries who were not successful at the 2000 Olympics. This indicates that competition in athletics is dynamic and the market leaders changed between 2000 and 2015. Even though lower scores were found for the other disciplines in men's and women's competition, these competitions can still be described as highly competitive markets. In general, levels of dynamic changes in competitive balance were higher in women's competition than in men's competition.

Third, spearman rank correlation based on three different indicators (CR4, CV and HHI) identified systematic changes in competitive balance for athletics between 2000 and 2015. All indicators, except the CV based on medal MS, indicated a significant decrease of competitive balance for athletics. The 2000 Olympic Games and 2001 world championships were identified as most balanced, while the 2011 world championships and the 2012 Olympics were the most unbalanced competitions.

According to CR4 and CV, competitive balance decreased significantly in men's competition, while only one indicator (CR4 top-8) showed a significant reduction of competitive balance among women's competition. An analysis of the different disciplines in men's and women's competition, demonstrated a systematic decrease of competitive balance in sprint/hurdles, long distance running and race walking for women and middle distance running for men. Comparable results for women's competition were identified for indicators of competitive balance calculated based on medal market shares.

According to CV, a significant trend towards a more balanced medal distribution was identified in men's long distance running. No other significant changes were found in men's medal competition. Additionally, different negative correlations were identified both for indicators based on medal and top 8 MS, but these correlations were not significant.

Finally, a cross-sectional analysis ranked the different disciplines for every competition to identify the most balanced discipline. Based on averaged score between 2000 and 2015, long distance running events were identified as the most unbalanced for men and women. Most balanced discipline for women were the jumping events, while both jumping and throwing events were most balanced in men's competition. Generally, men's competition has been identified as more balanced than women's competition.Based on these results, this study concludes that the dynamic changes of market leaders in athletics disciplines combined with a reduction of competitive balance represents a market structure in which new countries which are more successful than their predecessors dominate the international competition in athletics.

Complementary to this industry perspective on the decrease of competitive balance in athletics, three other research papers have been developed to evaluate countries capacity to develop organisational resources to obtain a competitive position in athletics.

A METHOD TO EVALUATE COUNTRIES' ORGANISATIONAL CAPACITY

As indicated in the introduction, there is a plethora of sport studies examining organisational resources (e.g., Bar-Eli et al., 2008; Böhlke, 2007; Robinson & Minikin, 2012; Smart & Wolfe, 2000; Wicker & Breuer, 2011). However, it is unclear how elite sport policies and resources are combined and organised within sport specific contexts (Truyens et al., 2014). For example, a policy direction for winning medals at Olympic Games influences how sport organisations support talented and elite athletes, and their coaches. Although elite sport policies offer direction on resource configurations, it is unclear what configurations are used to achieve policy goals.

Truyens et al. (2014) conceptualised the organisational resources and first order capabilities (ORFOC) framework. This framework emerged from the application of SPLISS (De Bosscher et al., 2006) in athletics. In the ORFOC framework, Truyens et al. (2014) advanced the SPLISS model by identifying the organisational resources and practices of the policy pillars of the SPLISS model in athletics. As a result, the ORFOC framework lists 98 organisational resources and first order capabilities. Organisational resources in sport involve human (elite athletes, coaches, managers), financial (funding streams, athletes wages, sponsorship), and physical (training infrastructure, medical centers, training camps) properties (e.g., De Bosscher et al., 2006; Madella et al., 2005). These resources are the building blocks of countries' competitive position and subsequent success (Eisenhardt & Martin, 2000; Sotiriadou & Shilbury, 2013).

Elite sport practices and programs are designed based on different combinations of organisational resources (e.g., Digel, 2002; De Bosscher et al., 2006; Madella et al., 2006). Barney (1991) classified business resources into human, physical and organisational resources. These human resources (athletes, coaches, managers), physical resources (training infrastructure, medical centres) and organisational resources (the formal organisation of the NGB and the national coordination of the sport) are the building blocks of countries' competitive position (Eisehardt & Martin, 2000; Sotiriadou & Shilbury, 2013).In the context of this study, elite athletes are individuals who represent their country at a major international competition, like World Championships or Olympic Games (Sotiriadou & De Bosscher, 2013). Organisational capabilities represent the capacity of an organisation to combine and organise such resources (Amit & Schoemaker, 1993). While first order capabilities represent a combination of resources, high order (or core) capabilities are bundles of first order capabilities (Wang & Ahmed, 2007). Truyens et al. (2014) suggested that the combination and interrelations of organisational resources and capabilities shapes resource configurations. As such, a strong organisational capacity of a country, or a sport system, to structure and configure resources for high performance development enhances the likelihood of international sporting success (Robinson & Minikin, 2012). Significantly, resources have potential strategic value that can be realised only when they are aligned with other important organisational resources. As such, resources require strategic management action (Ketchen, Hult, & Slater, 2007).

Building on the ORFOC framework, this study used composite indicators (i.e., a combination of quantitative and qualitative indicators) and a configuration analysis to measure and identify the organisational capacity in five sport systems. A composite indicator is designed to simplify and quantify the presence or development of resources and represent a mathematical combination (or aggregation) of a set of indicators (Saisana & Tarantola, 2002). Hence, the use of composite indicators enables the evaluation of the resources and capabilities of the ORFOC framework in an empirical environment. These resources and capabilities are organised into 10 dimensions; (1) financial support for athletics, (2) governance and organisation of athletics policies, (3) youth participation, (4) talent identification and development, (5) athletic career support, (6) athletics training and competition facilities, (7) coach provision and development, (8) international competition, (9) scientific research, and (10) the elite sport environment.

In addition to composite indicators, a configuration analysis was used to evaluate how organisational resources are configured to enhance organisational capacity. A configuration analysis suggests that "organisations are best understood as clusters of interconnected structures and practices, rather than a modular or loosely coupled entities whose components can be understood in isolation" (Fiss, 2007, p. 1180). This analysis adds an understanding to the structure of and relationship between organisational resources in athletics and high performance practices in these countries. These configurations may uncover the ways that existing elite sport policies and policy direction may create

dependencies or relationships across sporting and non-sporting organisations. Such resource dependencies may influence organisational capacity and elite development practices (Karg, 2011).

Data were collected from five sport systems including Belgium (separated into Flanders and Wallonia), Canada, Finland and the Netherlands. The participating countries were selected on the basis of their level of success in athletics. Specifically, at the World Athletics Championships held in Berlin in 2009, Canada won one silver medal and gained two top-8 places, Finland and the Netherlands achieved both two top-8 places and Belgium had one top-8 ranking (International Association of Athletics Federations, 2009). Also, the pragmatic reasons for the selection of the countries were the availability of a local researcher, access to data, and gaining the country's governing athletics body's consent to participate in the study.

Given the complexity of international comparative research, a group of three researchers with expertise in sport policy research and athletics as well as familiarity with the organisations responsible for the development of athletics was set up. The lead investigator was responsible for coordinating the research team, organizing meetings to validate the data and managing all the aspects of the study, including centrally coordinating data collection and analysis. Prior to collecting data, the researchers received a research protocol and manual with guidelines on data collection and the completion of the instrument (i.e., a large scale questionnaire that was used for structured interviews). The guidelines were discussed in detail over an initial two-day meeting and detailed how to complete the instrument, collect, and save the data. These guidelines were used to safeguard the reliability of the study and maintain objectivity during data collection and analysis.

The researchers collected data through (a) structured interviews with high performance directors, policy representatives and national experts in athletics (referred to as experts from here on), and (b) secondary sources (e.g., strategic plans and policy documents). In order to collect the structured interview data, a standardised instrument, the resources inventory for elite athletics, was designed. This inventory was a large scale questionnaire that included qualitative and quantitative measures on the 10 dimensions and 98 resources and capabilities of the ORFOC framework (Truyens et al., 2014). Specifically, the resources inventory included more than 500 closed and open-ended follow up questions, in English, that formed the points for discussion during the structured interviews with the experts. Rather than collecting opinions or experiences, the aim of the interviews was to provide a deeper understanding of the development of specific resources and their configurations.

To ensure a degree of comparability for the various resources of the ORFOC framework, closed questions were used to specify and compare the key characteristics of the resources. An example of a closed question included (for Dimension 7: Coach provision and development): "Do former elite athletes have the opportunity to follow a short track qualification course and become a qualified elite coach?" (closed, Y/N question). If the experts answered yes, then follow up open-ended questions were used as probes to collect further information. For instance, "Please describe the criteria for elite athletes to participate in the qualification course" and "What is the content and timeframe of this qualification level?" (open-ended questions). Hence, the open-ended questions used during the interviews to gain further insights into the presence, the level of development of organisational resources (e.g., the content of talent programs, specific facilities in high performance centers), and the functioning of more complex capabilities (e.g., instruments for talent identification, talent pathways or licensing systems for coaches). The responses to the closed questions from the recourses inventory were scored using various indicators examined in the section that follows. The data from the open-ended questions were used to offer deeper detail and understanding on the characteristics and traits of the organisational resources.

Using the resources inventory, 14 national athletics coaches or high performance directors (Finland N=4; Flanders N=4; Netherlands N=3; Wallonia N=3) were interviewed several times in order to reach saturation of data (Sotiriadou & Shilbury, 2010) for each participating country. The lead investigator collected data from Wallonia, Flanders and the Netherlands. The other researchers involved in the study were located in Canada and Finland. The secondary sources served two purposes; they (a) provided background information on the development of specific organisational resources, and (b) assisted in reaching data saturation in the resources inventory. During document analysis, the researchers were looking for information, such as selection criteria for talent programs, the structure of coach education programs, and the organisational structure of the NGB. In addition, the documents were used to ascertain the accuracy of certain figures or facts that were mentioned during the interviews (e.g.,

accurate number of athletes in various programs). The triangulation of data types helped fill gaps in relation to the historical and organisational contexts in which organisational resources develop.

The secondary sources and the completed resources inventories were submitted as digital documents to the main author who was responsible for the data analyses. Due to language barriers, the Finnish researcher translated important information from policy documents from Finnish to English. The main author was native Dutch speaker and the remaining of the documents were in English. The lack of standardised and comparable data on the 10th dimension of the framework (i.e., elite sport environment, which refers to the development of the sport, the country's culture and tradition in athletics, the corresponding media attention, and the management of the athlete's environment), lead to the exclusion of dimension 10 from the comparisons.

To score the data from the recourses inventory three types of indicators were used. These were (1) dummies (DU), (2) a combination of dummies (CDUs), and (3) quantitative indicators (QN). Dummy indicators (DUs) were represented by a dummy value (0 or 1). For example, a dummy indicator was "Do you have a policy plan?" (Yes = 1, No = 0). Then, combinations of dummies (CDUs) were used to collect additional details on these resources. So, in the previous example, if the answer was 'Yes', then various CDUs were used (e.g., "Is there anything included in the policy plan on how you detect and select athletes?", "Do you provide an elite sport training course?"). In terms of scoring CDUs, the more characteristics that could be identified for a specific resource, the higher the value on the scale. The quantitative indicators (QNs) were scored between 0 (minimum) and 1 (maximum). They were mostly used in the evaluation of financial or human resources (e.g., number of talented athletes, elite athletes, coaches). The scores were given based on a distance from the highest value. To clarify this point, the country with the highest values automatically received a score of 1, and the scores of the other countries are represented with a percentage of that maximum score.

In total, the inventory incorporated more than 270 indicators; 73.36% of them were DUs (0 or 1), 11.31% of them used a nominal scale based on CDUs and 15.33% of them were QNs. Table 1 offers an example of the scoring for each of the five sport systems for resource 4.12: 'A national talent status for upcoming athletes', and includes the three types of indicators used to weight the index scores.

The score on the DU shows that all countries had a national talent status to support talented athletes (a score of 1 for the first indicator). The second indicator in this example (CDU) evaluates the educational support provided to talented youth using seven different sub-indicators (labeled A to G). The mean of all index scores for these seven sub-indicators represents the value of the educational support services in these countries. While Finland provides all seven educational support services, Canada does not offer any. The third indicator in this example evaluates the number of athletes with such a national talent status (QN). As Finland had the most athletes with such a status (N=400), it receives the maximum score of 1. Flanders, on the other hand, had 49 athletes with a national talent status and that represents an index score of .12 compared to Finland.

Some resources are of greater significance or organisational value than others (Freudenberg, 2003). Therefore, the relative importance of each resource and capability listed in the inventory was rated using a scale from 1 to 3 (1 = basic level of organisational value; 2 = moderate level of organisational value; 3 = high level of organisational value). These values were discussed and agreed during a second two-day face-to-face meeting with the athletics expert researchers in order to avoid overestimating those resources for which fewer indicators were available and to balance the impact of specific indicators (Freudenberg, 2003). This rating is illustrated in column R in Table 1.
Allocating a relative weighted value has been previously applied in sport management studies, including the SPLISS study (De Bosscher et al., 2009) and in the design of the RAT tool (Robinson & Minikin, 2012). Such values signify that not all resources are of equal importance to the development of organisational capacity for specific dimensions and enables researcher to differentiate between resources.

The last row in Table 1 shows in bold the final and the weighted index scores (WISs) for Resource 4.12. The final WIS for a resource is calculated using the weighted average of its indicators. For example, the second (i.e., CDU) and third (i.e., QN) indicators for Resource 4.12 are rated with value 2, making the impact of the second and third indicators twice as high the first indicator (i.e., DU) with a value of 1. Using Canada as an example to illustrate how the final WISs are calculated, Canada's score of 0.22 was derived as follows. The equation is (1*1R)+ (0.00*2R)+(0.05*2R)+ = 1.1 on a total of 5 (the sum of maximum scores). To explain this equation, the final WIS is the sum of three multiplications

of scores (for Canada in this example). As such the score from this equation for Canada is 0.22 (i.e., 1.1/5). Then, the calculated final WISs of each resource are used to calculate the final WISs for each dimension. To differentiate these final WISs we refer to them as composite scores because they refer to the combination of WISs.

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FINDINGS

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The results are presented in three parts. Part one begins with a comparison of the composite scores which show how the five sport systems scored (high or low and in which resources). In this comparison, the countries' final scores (i.e., composite scores) demonstrate the resource development levels in nine dimensions. Using the final WISs (see Table 2) we stress key findings on various dimensions of the ORFOC framework. Then, we present and compare the various levels of elite athlete success in these five sport systems. This analysis draws on the top-8 performances and medals won. Last, in the first part of the results section, we combine afore mentioned sets of findings to present the links between scores on resources and level of success. Part two presents results that show how resources are configured in different ways and are operationalised into various practices or programs. Specifically, this part shows country variations in (a) the levels of centralisation of their programs, (b) the emphasis they place on different levels of athlete development, and (c) the prioritisation of their funding toward specific disciplines in athletics. Part three presents the findings on the resource dependencies. Among other interesting findings, the section shows the ways that configurations create dependencies or relationships across sporting and non-sporting organisations on areas such as programs and training facilities.

Part one: Composite scores, WISs, and elite success

Table 2 displays the participating countries' final scores (i.e., composite scores) that demonstrate the resource development levels in nine dimensions. The comparison of the composite scores reveals that Finland has the highest scores in six of the nine dimensions of the ORFOC framework as highlighted in bold. Specifically, compared to the other countries Finland has the highest scores on national and international competition opportunities (97.56), financial support (79.78), youth participation (77.88), governance and organisation (75.78) of athletics' policies, athlete career support (68.24) and scientific support (58.33). Flanders has the highest score for talent identification and development (81.80) and shares the highest score with Finland for scientific support (58.33). The Netherlands has the highest score on coach provision and development (70.77) and Canada leads on training and competition facilities (54.13). Wallonia has the weakest scores for all dimensions except from athlete career support. All sport systems have a low score on training and competition facilities (i.e., around or below 0.5). Also, with the exception of Flanders and the Netherlands, all other countries have a low score on talent identification and development, especially with regard to resources for talent identification. The highest scores among all dimensions were obtained for youth participation. Interestingly, all sport systems score relatively well on the fifth dimension (athlete career support) with only a small range difference between them.

In drawing some additional details, the final WISs for Dimension 1 in Table 2 (i.e., an overview of the dimensions, resources and indicators) show that Finland has the highest score for financial support (79.78) and athletics is supported by the most diverse (i.e., governmental funding, commercial and private resources) and the highest amount of financial resources (i.e., resources 1.1-1.3). The data in Figure 1 shows that Wallonia has experienced the highest budget increase since 2005 (indicated by the grey bars), (€422,879 in 2005 and €987,533 in 2009). This represents a budget increase of 133.53% but the amount of funding is still low compared to the €4,127,139 spent in Canada in 2009 where funding increased by 69.29%. In Flanders, the funding for elite athletics grew by 45% in 2009 to reach €1,659,632. Although the Netherlands and Finland had similar levels of national expenditure levels for athletics in 2009 (€2,291,595 and €2,900,000 respectively), Finland witnessed the smallest budget increase (16.79%) while the Netherlands experienced a rather large increase (86.53%).

Further data analysis showed that Flanders (81.80) and the Netherlands (74.49) scored the highest on talent identification and development (Dimension 4, see Table 2). In particular, they have specific programs and initiatives for talent identification and development that the NGBs coordinate (a battery test and regional training sessions for the detection and development of athletes), and they have high scores for 'training pools of talented athletes and elite sport schools'. This was because they have different districts organizing discipline specific training sessions starting at a different age at each country, and specific talent camps. Even though there are different organisational resources to support

the talent identification structure in Finland, data from the open-ended questions revealed fragmentation within the organisational structure in relation to talent development.

Some interesting results from the WIS on Dimension 7 (Coach provision and development) show that the Netherlands leads with a WIS of 70.77 (see Table 2). A key characteristic of this dimension is formal coach qualification structures. These structures vary among sport systems with results showing different coach education levels, coaching environment (i.e., community, instruction or performance environment) and contexts (i.e., beginner, intermediate, advanced) for coaching. For instance, Athletics Canada and the Royal Dutch Athletics Federation (Atletiekunie) in the Netherlands provide five different qualification levels, with specific attention to top level elite coaching and their overall qualification structure is competence-based (i.e., candidates have to provide evidence of specific competences during training or competition environments rather than pass an exam) whereas in Finland, Flanders and Wallonia the different courses throughout the qualification levels are more lecture-based. Also, even though Finland has the largest group of full-time coaches (N=80) and it provides them with the best financial conditions, the qualification structure is uncoordinated and divided among multiple organisations.

In order to asses if indeed organisational capacity leads to a superior performance (Fahy, 2000), the international sporting success of these systems is briefly discussed here. The analysis of the top-8 performances between 2005 and 2012 at World Championships and Olympic Games (see Table 3) reveals that Canada performed better compared to all the other countries, both in terms of the number of top-8 performances and the number of medals won (top-3 places). A closer analysis also reveals that Canada achieved the most top-8 places in most disciplines, except for relays and throwing events. Interestingly, Belgium was able to secure six top-8 places in relay events (sum of Wallonia and Flanders) which is the highest result compared to all the other countries. Finland won 14 top-8 places in the throwing events, and 11 of these 14 top-8 places were in javelin. None of the countries were successful in race walking events, and only the Netherlands secured top-8 performances in long distance running events.

Using an example to draw links between the findings so far, even though Finland scored best on most of the dimensions, and one would expect Finland perform well at the elite athletics level, it was successful only in throwing events. In comparison, Canada has generally high composite scores (see Table 2) and the best performances (see Table 3). Hence, Finland's best scores are not reflective of level of success. This can be explained by the fact that scores represent the availability of organisational resources, but do not necessarily explain how these systems build organisational capacity. This is also reflected in the data presented in Table 4 which shows that Canada has the greatest number of elite athletes, high performance centers and coach qualification levels, and Finland has a large number of national coaches, clubs and talented athletes with a national talent status.

These findings, however insightful, do not help evaluate how organisational resources and capabilities are combined in a country's pursuit of competitive advantage. Therefore, next we draw on results that assist in the examination of resource configurations.

Part two: Resource configurations

The results on the resource configurations (i.e., the alignment of organisational resources and capabilities in specific practices) illustrate the differences between sport systems and the ways countries combine their organisational resources in different ways and set different priorities. These configurations show country variations in (a) the levels of centralisation of their programs, (b) the emphasis they place on different levels of athlete development, and (c) the prioritisation of their funding toward specific disciplines in athletics.

Specifically, data from the Athletics Canada 2009-2012 High Performance Plan indicated a clear change in the Canadian elite system from a decentralised to a semi-centralised system, with six high performance centers and professional training support by elite coaches, appointed by the NGB. Similarly, since 2008 the Atletiekunie in the Netherlands uses a full-time centralised training approach to support elite athletes, and promotes an athlete-centered approach that is supported by full-time coaches in a centralised training environment. Canada and the Netherlands provide profound and full-time support structures in high quality training environments, and appear to implement a top-down approach to supporting elite athletes. Their systems are comprised of full-time training programs led by national coaches. This means that besides the financial support for elite athletes, NGBs receive specific support to facilitate full-time elite training programs. In Canada, the Athlete Assistance Program and

the Own the Podium elite program support, are implemented in national training centers. In the Netherlands, Atletiekunie gathers the best elite athletes in a centralised training program directed by national coaches for at least 75 days a year to receive program support.

On the other hand, Finland, Flanders and Wallonia do not provide coordinated centralised programs and elite athletes in these three systems receive personal financial support. In fact, compared to the Netherlands and Canada, Finland and Flanders place a key emphasis and have better structured youth participation, and talent identification and development programs. The NGBs in Finland and Flanders start talent development processes with regional and national training groups at an early age, and while training support is provided to younger athletes (>14 years) in central training environments, elite athletes train most of the time with their personal coaches. The regional and national identification programs in these countries are supported by talent training sessions and the expertise of full-time talent experts. A major difference between Flanders and Finland is that all practices in Flanders are coordinated by the NGB, while the existing resources and practices in Finland were described by the experts as uncoordinated. As Finland and Flanders provide program support for the development process of athletes, it appears that these sport systems apply a bottom-up approach to elite athlete development. Most of the elite funding in Flanders is allocated toward elite sport schools in order to support talented athletes between 12 and 18 years old in elite training environments that are supported by national coaches. Elite sport school support and the combinations of resources used to support it (e.g., coaches, funding, training facilities) represents strong resource configurations for talent identification and development. In Wallonia, the NGB receives financial support based on its policy plan and most funding goes to support elite athletes and international training camps. The sport system does not reflect a top down or bottom up approach, they fund elite athletes for personal training but they do not have a talent identification program.

Last, but not least, the results show a tendency for certain sport systems to prioritise their funding to specific disciplines. Hence, strategic priorities can determine recourse configurations. Data from the inventory show that in Canada, program-based support was focused on sprints and relays, selected technical events, and middle-distance running (800m and 1500m). In the Netherlands, central training programs were organised for joint events, distance running, shot put/discus and pole vault. Finland, Flanders and Wallonia had an egalitarian approach (i.e., non-prioritizing or focusing on specific athletics events) to athlete support, whereby individual athletes received financial support if they met national performance criteria. Even though in Finland there was no strategic priority given to a specific discipline, both the additional scientific support and the specialised training camps dedicated to javelin were unique organisational resources devoted to javelin throwers. As Table 3 earlier showed, success in the Netherlands and Canada is widespread over many disciplines even though they focus on specific disciplines.

Part three: Resource dependencies

The results show that Finland and the Netherlands depend on resources or support programs provided by external organisations or TPOs. Specifically, strong resource dependencies can be found in athlete development. This is because elite sport schools for young talented athletes are organised by TPOs. In Finland, there are different talent development pathways that combine secondary education and training development. The national sport schools are coordinated by the NOC (i.e., there are 24 national sport schools, 43 local sport schools, and 14 sport institutes), not the NGB. Hence, in spite of a variety of facilities to support talent development and the availability of training support through secondary educational institutions, training support and athlete development is not coordinated or supported by the NGB. In the Netherlands, the Topsport Talent schools and the Atletiekunie provide different pathways for athletes towards a high performance status: Topsport Talent schools provide educational support services to athletes with a national NOC*NSF talent status at a regional level, whereas the Atletiekunie provide central training facilities at the age of 16.

Figure 2 provides visual representations (i.e., national resource configurations) of how different resources from various dimensions of the ORFOC framework (e.g., dimension 3: sport participation, dimension 4: talent identification, and dimension 5: development and career support) are configured into practices. To understand the way these national configurations are designed and depicted in Figure 2, the NGB as the body responsible for elite development is at the center of each sport system configuration. Regional departments for athletics and athletics clubs (showing in white squares) represent organisations that are affiliated with the NGB. National programs or practices organised by

the NGB are showing in circles. Elite programs offered outside the NGB (e.g., Own the Podium in Canada) and/or non-sport specific organisations (e.g., institutes of sport and Olympic Committees) are represented in black rectangles.

A key finding from analysis of the data presented in Figure 2. A key point to note in Figure 2 is the strong dependencies that exist on TPOs, particularly regarding training and competition facilities. NGBs in athletics appear to depend on national, regional government, or other sport organisations, that develop sport programs or specific facilities. For instance, in Wallonia, there was no specific elite training environment for athletics. In the Netherlands there was no indoor 200m track until, in collaboration with national partner organisations, including NOC*NSF, they constructed Omnisport Apeldoorn in 2009. Both sport systems used the indoor competition facilities of Flanders to organise training programs and indoor competitions. Since 2008, most elite athletes have trained in the national training centre, Papendal, or the regional training centre Sittard (especially for pole vaulters). Flanders has an indoor competition track that is funded by the national sport agency Sport Vlaanderen, which is used as an elite training centre, but shares this facility with other sports (e.g., gymnastics) and commercial or third party events. Training support for elite distance runners is, together with the elite sport school, provided on a university campus. On the other hand, in Finland, there is a network of sport institutes (four in total, with two of them providing specific facilities for elite athletics) and sport academies. However, the sport institutes are independent organisations and not coordinated by the NGB. Another point to note, with reference to Figure 2, is the multiple organisations that exist in some sport systems that offer similar programs. To illustrate, in Finland, the main path of elite development structure is represented by multiple organisations (e.g., clubs and NGBs) and various talent identification and development programs (e.g., district organised training camps). Additionally, districts (21 districts supported by Finnish Athletics) and the area organisations provide training camps to talented athletes. Furthermore, national and local high sport schools, and sport institutes provide similar support programs (like study flexibility and central training).

DISCUSSION AND CONCLUSION

This paper identified and evaluated the organisational capacities of five sport systems for elite athletics based on (a) the development of composite indicators and (b) a configuration analysis. In this international comparison, the composite indicators show that there is a variance between the five sport systems regarding the development of organisational resources. Finland scored the highest in most of the dimensions of the ORFOC framework, followed by Canada and the Netherlands. The results also showed that countries organise their resources in very different ways resulting in varying resource configurations. Specifically, sport systems' structural differences are expressed by the different priorities in the development process of elite athletics and the ways organisational resources are allocated. For instance, sport systems vary in relation to the level of *centralisation* of training programs, the *prioritisation* of specific athletics disciplines over others, and the *focus* placed through athlete development programs at different levels of development. While Canada and the Netherlands provide centralised training programs for high performance athletes, Finland, Flanders and Wallonia support their high performance athletes on an individual basis. Athlete development programs in Canada and the Netherlands focus on the top levels of talent development. Canada and the Netherlands are the only two countries that concentrate on specific priority disciplines within athletics which supports the view that certain sports can deliberately allocate more resources toward most promising disciplines in a sport. Flanders and Finland allocate more organisational resources on sport participation, and programs for talent identification and development at grassroots levels. These findings illustrate countries' organisational capacity to combine and deploy their resources and the way they allocate them across specific practices. These findings respond to several calls for further examination on the ways specific sports organise and align resources and policies (De Bosscher et al., 2015; Oakley & Green, 2001; Truyens et al., 2014) and have various and practical implications.

The theoretical contribution of this study rests on the development of composite indicators and country-specific resource configurations. Specifically, composite indicators and resource configurations advance a generic organisational resource framework, the ORFOC framework (Truyens et al., 2014) in a tool that measures and evaluates sport- and country specific organisational resources, capacities and resource configurations. Hence, the study offers a more dynamic framework that helps identify and evaluate countries' organisational capacity to allocate resources. A basic premise of the RBV is the notion that aligning organisational resources to create positions of sustainable competitive advantage

can lead to superior performance in the marketplace (Fahy, 2000). The evaluation of countries' organisational resources and the identification of different resource configurations for athletics provide understanding on how these countries build strategy from specific resources and capabilities. In addition, the use of multiple countries offered the opportunity to draw comparisons between countries resource development and configurations.

These comparisons help understand how countries develop strategy from specific resources and capabilities and pose significant practical implications to high performance managers and elite sport policy makers. Specifically, even though Finland had the best index scores in this study, it was not successful in tailoring organisational resources in a coordinated elite sport system that would ultimately resulted in significant levels of international sporting success. This leads us to conclude that possessing organisational resources alone does not guarantee the development of a competitive advantage in athletics. This conclusion concurs with Misener and Doherty (2009) and Ketchen et al. (2007) who argued that the organisational capacity of a country depends on the ability and efficiency to structure and configure crucial resources for high performance development. As Ketchen et al. (2007) noted, strategic resources as such only have potential value. Realising this potential requires alignment with other organisational resources. This is because even though Finland had higher composite scores than Canada and the Netherlands (the most successful athletics nations), the latter built stronger resource configurations including considerable strategic action. It can therefore be suggested that (a) a centralised approach to training athletes, (b) the availability of talent development programs at the top level of athlete development stages, and (c) targeting specific disciplines within athletics, provided a successful resource configuration for Canada and the Netherlands that aligned organisational resources strategically.

In addition to aligning organisational resources strategically, Canada and the Netherlands also scored generally well (although second to Finland) on the deferent dimensions (as represented by the index scores). Based on the composite indices representing the development of key organisational resources, the results indicate that both the development and the alignment of resource configurations are necessary for a country's organisational capacity to achieve a superior market performance. Canada and the Netherlands are most efficient in deploying resources by constructing organisational systems that may enhance sporting success and improve performance levels for a longer term (see Figure 3.5). Such successful outcomes reiterate Smith and Nicholson (2012) suggested links between the matching of an organisation's activities to its resource capabilities and the influence of strategic decisions on the long term direction and success of the organisation. Consequently, when setting out the strategic direction and resource allocation, high performance managers and elite sport policy makers should take into account the ways resources are configured and the potential long term implications these configurations may present to athlete success.

Especially in Finland, Flanders and Wallonia, structural dependencies of the NGB for athletics on national or regional governments or sport organisations are identified. According to literature, dependency decreases the autonomy of organisations (Pfeffer & Salancik, 1978) and limits the decision-making alternatives (Papadimitriou, 1998). As competitive advantage is defined as the ability to combine internal resources for implementing a value creating strategy (Bar-Eli et al., 2008), external resource dependency can limit an organisation's capacity. There is also a clear link between the use of the RBV of strategic management in sport and its contribution to elite sport policy as it assist us to understand how key dimensions of elite sport policy (e.g., talent identification, career support, coach provision and education) are developed within a specific sport. Further, the analysis of resources configurations reveals that the interrelationship of resources and capabilities can be a source of competitive advantage and the study shows that clarity on resource configurations can help achieve elite sport policy goals.

RECOMMENDATIONS

This study on the organisational capacity in elite athletics recognised the added value of strategic management action to be able to comply to the market dynamics in international competition. Rather than a list of resources, the RBV underlines the importance of strategic management action in the development of strategic resource configurations. Strategic resources only have potential value which can be realised when they are aligned with other important organisational resources (Ketchen, Hult & Slater, 2007). After all, organisations represent clusters of interconnected structures and practices, rather than diverse independent elements (Fiss, 2007). According to the RBV, a competitive position can only

be achieved when resources are configured to match the opportunities in the external environment (Grant, 2010; Wernerfelt, 1984). Translated to the analysis of competitive advantage in elite sport, a configuration analysis added understanding of the strategy of countries in athletics as a function of the interplay between organisational resources.

This study provides a deeper understanding of the effectiveness of nations' strategy in their attempt to obtain international sporting glory. This study helps understand the ways countries structure, combine and align resources and capabilities.

The ORFOC framework and the methodology can support policy makers and high performance directors of NGBs in athletics to question their national strategy to obtain international sporting success in athletics according to a comprehensive set of organisational resources which can improve their organisational capacity. This tool can support NGBs to reinforce strategy development, to comply to policy and funding targets and strengthen the efficiency of national resource configurations.

For international sport organisations like European Athletics and the IAAF, this methodology can contribute to the organisational support provided to its member federations to improve governance and/or organisational capacity regarding international sporting success. Rather than an assessment tool, the methodology can serve as an instrument to strengthen countries' competitiveness, supported by practical workshops or interactive learning features from experts within the field.

From a research perspective, the methodology used in this study could serve as a future research tool to apply the ORFOC framework to other countries, at different points in time. An analysis of more countries could provide supporting evidence on the correlation between countries' organisational capacities and their level of international sporting success.

The findings in this study may be temporary in nature as people, resources, programs and policies change or become outdated. As resources change so do resource configurations. Therefore, if countries were to utilise the outlined composite indicators and configuration analysis of the ORFOC framework, they would need to do so on a regular basis. The timing should coincide with their strategic high performance planning cycle in order to maintain a competitive advantage. Additionally, given the path-dependent nature of resource configurations, it is meaningful to examine the impact of changing configurations on long-term performance or vice versa. Furthermore, additional research on resource dependencies and the cooperation between government organisations and third party organisations might improve understanding on new models of elite sport development. Previous research has questioned the key role of NGBs or national sport systems in the development of triathlon (Newland and Kellett, 2014) and tennis (Brouwers et al. 2015). Even though this study does not provide evidence for a shift away from the typical government driven policy and funding model to include the emerging influence of the private sector, examples in athletics can be identified. The IAAF reported on an elite training centre located in Phoenix, Arizona which provides elite athlete and coach support. The organisation, Altis, represents itself as an elite athlete and coach training environment. If Altis would have entered the 2015 Beijing World Championships as a nation, it would have finished just outside the top ten in the medal table (International Association of Athletics Federations, 2015). Altis was represented by 17 athletes from 13 different countries, winning five medals. Additional research on the interplay between elite support structures, especially bottom up approaches and government funding and support structures could provide new insights on elite sport development structures in athletics.

STUDY HIGHLIGHTS

The major results of this study can be summarised by the following study highlights:
1. Key organisational resources in athletics were categorised in the ORFOC framework, congruent to common characteristics of elite sport development. As such, this demonstrates the applicability of the SPLISS model to a sport specific level in athletics.
2. More organisational resources do not necessarily refer to a greater capacity. Resources only have potential value which can be realised when they are aligned with other important organisational resources. The managing capacity and the efficiency of the interplay between resources determine the strategy and organisational capacity of countries.

3. High levels of organisational capacity, identified by high composite index scores and strategic resource configurations, do not guarantee a competitive advantage. Resource dependencies and micro- and macro-level factors also influence the development of success.
4. The application of the ORFOC framework in an international comparison shows tendencies of convergence to the common characteristics of elite sport development and the SPLISS model. The configuration analysis applied to a case study comparison, provided evidence of organisational divergence, in particular in relation to centralisation of training programs, prioritisation of specific athletics disciplines and focus on the elite sport development process.
5. The combination of composite indicator scores and a configuration analysis helps to understand which organisational resources countries develop and how these resources are strategically configured.
6. Countries with strong resource configurations (i.e. Canada and the Netherlands) are generally more successful in international competition.
7. The athletics competition is characterised by high levels of change in the subset of successful countries in combination with a systematic decrease of competitive balance in men's and women's competition. Between 2000 and 2015, women's sprint/hurdles, long distance running and race walking became systematically more unbalanced, just like middle distance running for men.
8. Policy representatives can benefit from an industry analysis to improve understanding of the market dynamics and the identification of disciplines where competitiveness is increasing and opportunities for success rise (e.g. jumping and throwing events).
9. A configuration analysis offers opportunities to SPLISS to identify the relationship between pillars and CSFs in order to understand the interplay between structures and practices rather than in isolation.