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An Analysis of Countries' Organizational Resources, Capacities, and Resource Configurations in Athletics

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Research on elite sport policy tends to focus on the policy factors that can influence success. Even though policies drive the management of organizational resources, the organizational capacity of countries in specific sports to allocate resources remains unclear. This paper identifies and evaluates the organizational capacity of five sport systems in athletics (Belgium [separated into Flanders and Wallonia], Canada, Finland, and the Netherlands). Organizational capacity was evaluated using the *organizational resources* and *first-order capabilities* framework (Truyens, De Bosscher, Heyndels, & Westerbeek, 2014). Composite *indicators* and a *configuration* analysis were used to collect and analyze data from a questionnaire and documents. The participating sport systems demonstrate diverse resource configurations, especially in relation to program centralization, athlete development, and funding prioritization. The findings have implications for high performance managers' and policy makers' approach to strategic management and planning for organizational resources in elite sport.

Keywords: organizational capacity, competitive advantage, athletics, resources, elite sport

Internationally, countries increasingly invest in elite sport development systems (De Bosscher, De Knop, van Bottenburg, Shibli, & Bingham, 2009) and improve their policies to reflect dominant international practices (Böhlke & Robinson, 2009). Different authors have argued that the strategic management of elite sport is based around a homogenous model of elite sport development but with subtle domestic variations (e.g., De Bosscher et al., 2009; Digel, Burk, & Fahrner, 2006; Green & Oakley, 2001; Houlihan & Green, 2008). While the dominant and common characteristics of elite sport policy development are known, the requirements to organize and deliver elite sport policies at a sport-specific level remain largely unknown (De Bosscher, De Knop, van Bottenburg, & Shibli, 2006; Sport Industry Research Centre [SIRC], 2002).

The literature on elite sport policy raises questions concerning the way policies are organized in different countries and highlights a divergence in the organization of policies within nations and sports (e.g., Andersen & Ronglan, 2012; Böhlke & Robinson, 2009; Newland & Kellett, 2012; Phillips & Newland, 2014). Countries tend to develop a competitive advantage in priority sports or specific events as they allocate most of their resources toward a small number of athletes or sports that are deemed as the most result capable (De Bosscher, Shibli, Westerbeek, & van Bottenburg, 2015; Sam, 2012; SIRC, 2002). Overall, research suggests that there is a need for international comparisons of the ways specific sports organize and align resources and policies (De Bosscher et al., 2015; Oakley & Green, 2001; Truyens, De Bosscher, Heyndels, & Westerbeek, 2014) or else the organizational capacity of countries to combine and deploy their resources to allocate them across specific practices and sports.

Gerrard (2003) stressed the need for studies on the ways countries leverage resources to achieve elite sport success and gain a competitive advantage because such studies would help in understanding countries' competitive position. On this premise, Robinson and Minikin (2012) compared the competitive advantage of three National Olympic Committees (NOCs) by investigating national federations. Other studies have identified organizational resources (or categories of resources) within clubs and leagues that can lead to the development of a competitive advantage (e.g., Bar-Eli, Galily, & Israeli,

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2008; Böhlke, 2007; Smart & Wolfe, 2000; Wicker & Breuer, 2011). Despite these growing efforts to understand the role of resources within sport organizations, the available evidence does not provide adequate knowledge that would allow evaluations and comparisons of countries' organizational capacity in specific sports (Truyens et al., 2014).

The purpose of this paper is to identify and evaluate the organizational capacity of five sport systems in elite athletics. By doing so, this paper helps identify the ways the participating countries combine and configure their organizational resources and capabilities into programs and practices. Organizations with effective use of resources and capabilities are more likely to have a competitive advantage, in other words, the ability to use internal resources for "implementing a value creating strategy that is not being implemented simultaneously by competitors" (Bar-Eli et al., 2008, p. 76).

To contextualize the purpose of this study and how it builds on previous work, it is important to take a step back and recognize that unlike other business, most sports are dictated by government policies on how resources should be allocated and spent. These policies, at the elite level, are best represented in the nine pillars of the *elite sport policies leading to international sporting success* (SPLISS) model (De Bosscher et al., 2006). Building on the nine policy pillars, Truyens et al. (2014) framed the *organizational resources* and *first-order capabilities* (ORFOC) framework, which identifies and lists the resources and organizational practices for each policy pillar at a sport-specific level (i.e., athletics). The present study applied the ORFOC framework in an empirical context to compare the resources across four countries (i.e., Belgium [Flanders and Wallonia], Canada, Finland, and the Netherlands). This was achieved by using (a) *composite indicators* to measure and score the ORFOC resources and (b) a resource *configuration analysis* to evaluate and compare the configurations of these resources. The development of these measures and subsequent comparisons allow countries to evaluate their strategic investment, support, and development programs in elite athletics and to assess their strategies against other countries. These four countries represent five sport systems for elite athletics because Flanders and Wallonia in Belgium have independent sport policy structures and national sport organizations (NSOs) for athletics.[1] Athletics (track and field) was selected as a case study because of its popularity among elite performing countries (i.e., 201 NOCs participated in the athletics competition at the London 2012 Olympics) (International Association of Athletics Federations, 2012), which suggests a reasonable level of organizational development among international competitors. Athletics offers 47 international events at World Championships and Olympic Games. These events are grouped into nine different disciplines: sprints, hurdles, middle distance running, long distance running, throwing events, jumping events, multi-events, relays, and race walking.

Organizational Capacity in Sports

A growing body of research examines the organizational capacity to perform (e.g., Newland & Kellett, 2012; Phillips & Newland, 2014; Wicker & Breuer, 2011); organizational performance of NOCs, national governing bodies (NGBs), and clubs (e.g., Bayle & Robinson, 2007; Madella, Bayle, & Tome, 2005; Nowy, Wicker, Feiler, & Breuer, 2015; Winand, Rihoux, Robinson, & Zintz, 2012); and the organizational resources for competitive advantage (e.g., Bar-Eli et al., 2008; Robinson & Minikin, 2011, 2012). For instance, Robinson and Minikin (2011, 2012) developed the readiness assessment tool (RAT) for NOCs, which evaluates the level of organizational development. It comprises eight different pillars of performance, representing the resources, structures, and capabilities of national federations (i.e., a NOC's main resources). Federations' resources and capabilities are essential for NOCs to become more capable, develop as organizations, and create a competitive advantage. In their comparisons between three countries in the Pacific, Robinson and Minikin (2012) concluded that there is a gap between federations' current levels of development and what is required (e.g., specialized and professional levels of development) to benefit from participating at the Olympic Games. In addition, evidence from research on the Maccabi Tel Aviv Basketball Club and the Football Club of Bayern München shows that both clubs were able to secure significant resources and to gain and sustain a competitive advantage (Bar-Eli et al., 2008). Having skilled management teams was found to be a key strategic asset for delivering a competitive advantage in using long-term sponsorship and media rights. In another study, Wicker and Breuer (2011) investigated the resources of German nonprofit sport clubs. Their results indicated that these clubs were characterized by scarce resources defining their organizational capacity to deliver their services.

Although the links between organizational resources and capacity to perform are becoming clearer, and research on organizational resources that lead to competitive advantage is growing, less attention is being paid to sport-specific applications of those concepts to recognize the individual nature of sports, sport-related resources and capabilities, and the ways these resources reflect sport-specific contexts (Andersen & Ronglan, 2012). Existing examples of studies in this direction (i.e., Böhlke, 2007; Brouwers, Sotiriadou, & De Bosscher, 2014; Madella et al., 2005; Newland & Kellett, 2012; Phillips & Newland, 2014; Sotiriadou, Gowthorp, & De Bosscher, 2013) stress the need to continue building knowledge on individual sport contexts and capabilities to succeed. For example, Madella et al. (2005) developed a swimming performance index that evaluated the organizational performance of four swimming federations based on scores for indicators in various organizational dimensions. Later, Böhlke (2007) evaluated sport-specific organizational practices of the Swedish Athletics Association and the Norwegian Skiing Federation, with

a specific focus on coach education. In his analysis, the success of elite sport policies was found to depend less on the level of resources or the sophistication of the support programs and more on the interactions between athletes, coaches, and support staff and the environmental conditions prevailing in those countries (e.g., training conditions or the sport's being a popular sport).

In an analysis of elite Sprint Canoe, Sotiriadou et al. (2013) found strong interrelations between elite sport policy and sport culture. The study showed that Canoe Australia implements policies in a culturally driven fashion that is unique to the Australian context. Similar to the results of Böhlke (2007) and Sotiriadou et al. (2013), Truyens et al. (2014) stressed the role of environmental and cultural influences in the development of individual sports. In addition, Phillips and Newland (2014) found strong dependencies on third-party organizations (TPOs) and local councils for the development of triathlon in the United States and Australia, especially for the delivery of events. As TPOs have the resources, infrastructure, and expertise to deliver all aspects of triathlon, governing bodies were seen as irrelevant to the development of the sport. Winand et al. (2012) focused on possible combinations of the key determinants of high performance of 18 sport governing bodies in Wallonia. Their findings led them to suggest that there is a need to further explore resources and their configurations and "take into account the ways factors affect each other in order to produce results" (p. 247). This study is a response to this recommendation and contributes to the growing research interest in the role of organizational resources and capabilities in developing a competitive advantage in elite sport.

The Organizational Resources and First-Order Capabilities Framework

There is a plethora of sport studies examining organizational 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 organized within sport-specific contexts (Truyens et al., 2014). For example, a policy direction for winning medals at Olympic Games influences how sport organizations 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) conceptualized the ORFOC framework. This framework emerged from the application of SPLISS (De Bosscher et al., 2006) in athletics. The SPLISS model encompasses the policy factors or strategic characteristics of elite sport policies in nine pillars and 144 critical success factors. In the ORFOC framework, Truyens et al. (2014) advanced the SPLISS model by identifying the organizational resources and practices of the policy pillars of the SPLISS model in athletics. As a result, the ORFOC framework lists 98 organizational resources and first-order capabilities.

Elite sport practices and programs are designed based on different combinations of organizational resources (e.g., Digel, 2002; De Bosscher et al., 2006; Madella et al., 2006). Barney (1991) classified business resources into human, physical, and organizational resources. These human resources (athletes, coaches, managers), physical resources (training infrastructure, medical centers), and organizational resources (the formal organization of the NGB and the national coordination of the sport) are the building blocks of countries' competitive position (Eisenhardt & Martin, 2000; Sotiriadou & Shilbury, 2013). Organizational *capabilities* represent the capacity of an organization to combine and organize 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 organizational resources and capabilities shape *resource configurations*. As such, a strong organizational 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 realized only when they are aligned with other important organizational resources. As such, resources require strategic management action (Ketchen, Hult, & Slater, 2007).

Method

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 organizational 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 organized into 10 dimensions: (1) financial support for athletics, (2) governance and organization 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 organizational resources are configured to enhance organizational capacity. A configuration analysis suggests that "organizations 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 organizational 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 nonsporting organizations. Such resource dependencies may influence organizational capacity and elite development practices (Karg, 2011).

Participating Countries and the Research Team

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 both achieved two Top 8 places, and Belgium had one Top 8 ranking (International Association of Athletics Federations, 2009). In addition, 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 organizations 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. Before 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 2-day meeting and detailed how to complete the instrument and collect and save the data. These guidelines were used to safeguard the reliability of the study and maintain objectivity during data collection and analysis.

Data Collection

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).

To collect the structured interview data, a standardized 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 (see 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 were used during the interviews to gain further insights into the presence and the level of development of organizational 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 resources 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 organizational 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 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 organizational 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 organizational structure of the NSO. 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 organizational contexts in which organizational 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.

Because of language barriers, the Finnish researcher translated important information from policy documents from Finnish to English. The main author was a native Dutch speaker, and the remaining documents were in English. The lack of standardized 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) led to the exclusion of Dimension 10 from the comparisons.

Indicators and Data Scoring

To score the data from the resources 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

Table 1 Example of Calculating the Final Weighted Index Scores for Resource 4.12

Resource 4.12 A national talent status for upcoming athletes		R[a]	CAN	NED	FIN	FLA	WAL
DU	There is a national talent status that offers talented young athletes the flexibility to combine career and studies, and access special facilities and programs	1	1	1	1	1	1
CDU	There are education support services for national talent status athletes (Y/N answers on 7 organizational characteristics)	2	.00	.57	1	.86	.71
	A. The support of a study coordinator		0	0	1	0	0
	B. Extra coaching and support training during school time		0	1	1	1	1
	C. Extra coaching and sport training during school time (athletics)		0	1	1	1	1
	D. Decreased study time (fewer hours of education/ days compared with regular students)		0	1	1	1	1
	E. An individual study program		0	0	1	0	1
	F. A special arrangement toward the planning of exams, with the possibility to delay		0	1	1	1	1
	G. Lifestyle/career support		0	0	1	1	0
QN	The number of talented young athletes with a national talent status in 2009–2010	2	.05	.33	1	.12	.00
Sum of weighted scores			1.10	2.80	5.00	2.96	2.42
Maximum weighted score			5.00	5.00	5.00	5.00	5.00
Final weighted index scores for Resource 4.12 A national talent status for upcoming athletes			**0.22**	**0.56**	**1**	**0.59**	**0.49**

Note. CAN = Canada; NED = the Netherlands; FIN = Finland; FLA = Flanders; WAL = Wallonia; DU = dummy (0 or 1); CDU = combination of multiple dummies; QN = quantitative indicator (0–1).

[a]Specific ratings (R) are provided for all indicators to differentiate according to their level of importance. Ratings are provided based on expert review.

in this example (CDU) evaluates the educational support provided to talented youth using seven different subindicators (labeled A to G). The mean of all index scores for these seven subindicators 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 with Finland.

Rating the Relative Value of Resources and Weighting the Index Scores for Dimensions and Their Resources

Some resources are of greater significance or organizational value than others (Freudenberg, 2003). Therefore, the relative importance of each resource and capability listed in the inventory was rated using a scale ranging from 1 to 3 (1 = basic level of organizational value; 2 = moderate level of organizational value; 3 = high level of organizational value). These values were discussed and agreed upon during a second 2-day face-to-face meeting with the athletics expert researchers 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 organizational capacity for specific dimensions and enables researchers 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 (e.g., the final WISs for each of the 16 [i.e., 4.1–4.16; see the Appendix] resources for Dimension 4) 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.

Results

The results are presented in three parts. Part 1 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 the Appendix) 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 the aforementioned sets of findings to present the links between scores on resources and level of success. Part 2 presents results that show how resources are configured and are operationalized into various practices or programs. Specifically, this part shows country variations in (a) the levels of centralization of their programs, (b) the emphasis they place on different levels of athlete development, and (c) the prioritization of their funding toward specific disciplines in athletics. The combination of part 1 and part 2 is essential to the evaluation of organizational capacity and competitive advantage as resources only have potential value for the development of a competitive advantage. Such an advantage can only be obtained when resources are aligned with other important resources (Ketchen et al., 2007). Part 3 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 nonsporting organizations in areas such as programs and training facilities.

Part 1: 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 with 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 organization* (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 athlete

Table 2 Composite Scores for the Nine Dimensions of the ORFOC Framework

Dimension	CAN	NED	FIN	FLA	WAL
1. Financial support	52.04	52.78	**79.78**	32.86	30.84
2. Governance and organization	74.17	75.51	**75.78**	52.31	32.78
3. Youth participation in athletics	65.42	65.75	**77.88**	75.25	42.87
4. Talent identification and development	46.54	74.49	53.57	**81.80**	23.97
5. Athlete career support	58.77	67.65	**68.24**	62.30	59.96
6. Training and competition facilities	**54.13**	40.12	45.62	40.12	11.47
7. Coach provision and education	51.14	**70.77**	54.38	47.47	37.82
8. (Inter)national competition opportunities	82.40	82.00	**97.56**	61.36	27.98
9. Scientific support	45.00	43.33	**58.33**	**58.33**	20.00

Note. ORFOC = organizational resources and first-order capabilities.

career support. All sport systems have a low score on *training and competition facilities* (i.e., around or below 0.5). In addition, 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 the Appendix (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) in Finland. The data represented in Figure 1 shows that Wallonia has experienced the highest budget increase since 2005 (indicated by the gray 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 with 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 the Appendix). In particular, they have specific programs and initiatives for talent identification and development that the NSOs coordinate (a battery test and regional training sessions for the detection and development of athletes, Resources 4.3, 4.4, and 4.6), and they have high scores on Resources 4.9 and 4.13 (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 organizational resources to support the talent identification structure in Finland, data from the open-ended questions revealed fragmentation within the organizational 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 the Appendix). A key characteristic of this dimension is formal coach qualification structures (i.e., Resources 7.2–7.6). 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. In addition, even though Finland has the largest group of full-time coaches ($N = 80$) and it provides them with the best financial conditions (as indicated by Resource 7.13), the qualification structure is uncoordinated and divided among multiple organizations.

To assess if indeed organizational 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 with 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

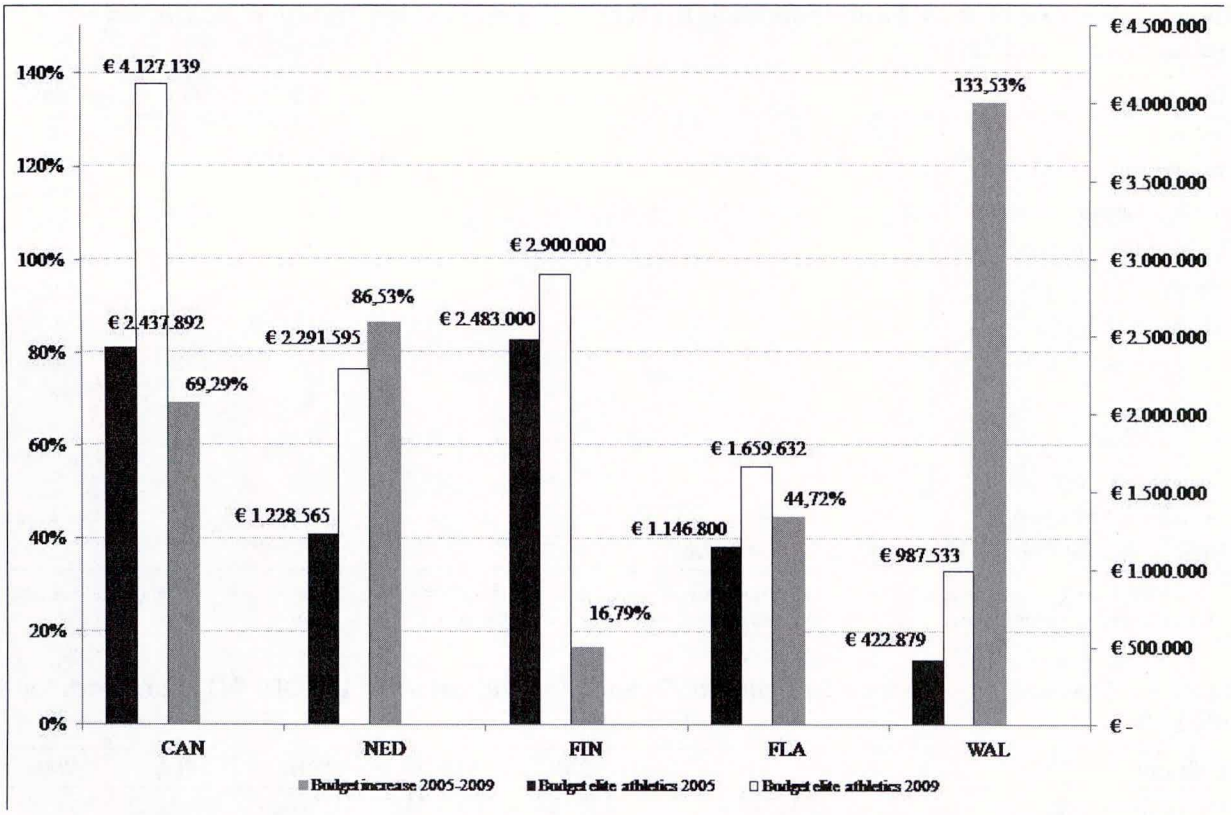

Figure 1 — The change in elite athletics funding between 2005 and 2009 (in Euros).

in relay events (sum of Wallonia and Flanders), which is the highest result compared with 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 to 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 organizational resources but do not necessarily explain how these systems build organizational capacity. This is also reflected in the data presented in Table 4, which show that Canada has the greatest number of elite athletes, high performance centers, and coach qualification levels, while Finland has a large number of national coaches, clubs, and talented athletes with a national talent status.

These findings, however insightful, do not help in evaluating how organizational 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 2: Resource Configurations

The results on the resource configurations (i.e., the alignment of organizational resources and capabilities in specific practices) illustrate the differences between sport systems and the ways countries combine their organizational resources in different ways and set different priorities. These configurations show country variations in (a) the levels of centralization of their programs, (b) the emphasis they place on different levels of athlete development, and (c) the prioritization 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 decentralized to a *semi-centralized* system, with six high performance centers and professional training support by elite coaches, appointed by the NSO. Similarly, since 2008 the Atletiekunie in the Netherlands uses a full-time *centralized* training approach to support elite athletes and promotes an athlete-centered approach that is supported by full-time coaches in a centralized 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, NSOs

Table 3 Number of Top 8 Performances at the World Championships and Olympic Games Between 2005 and 2012

Discipline	CAN	FIN	NED	FLA	WAL
Sprint	9	0	2	5	2
Hurdles	3	0	0	0	0
Middle distance running	3	1	1	0	0
Long distance running	0	0	2	0	0
Jumps	4	1	1	4	0
Throws	5	14	4	0	0
Multi-events	3	0	3	1	0
Relays	3	0	3	3	3
Race walking	0	0	0	0	0
Total of Top 8 places	30	16	16	13	5
Medals (Top 3 places)	7	4	4	2	2
Number of disciplines in which Top 8 places were delivered	7	3	7	4	2

Note. Medals and Top 8 performances for Belgium were split between jurisdictions according to the athletes' membership (i.e., Flanders or Wallonia). In the case of relay performances with athletes from both regions, the numbers were split in half.

Table 4 Absolute Figures for a Selection of Quantitative Indicators of the ORFOC Framework for 2009

Indicator	CAN	NED	FIN	FLA	WAL
Collective expenditure for elite athletics (in Euros)	3.322.369	1.384.754	1.030.000	1.484.632	824.694
Total national governmental funding for elite athletics/ inhabitant (in Euros)	0.10	0.19	0.19	0.24	0.24
Number of national coaches for elite athletes appointed by or for the NSO athletics	13	12	31	12	2
Number of performance managers supporting elite athletics in the NSO	7	2	6	2.5	2
Number of clubs affiliated with the NSO for athletics	300	289	650	89	45
Proportion of U20 level athletes (12–20 years) as members of the NSO for athletics	53.62%	36.47%	41.21%	34.88%	39.23%
Number of talented athletes with a recognized national talent status	18	130	400	49	1
Number of elite athletes in athletics with a recognized national talent status	83	26	62	59	47
Number of elite athletes who receive a monthly wage to be a professional athlete	66	3	10	22	9
Number of national high performance training centers for athletics	7	2	2	2	0
Number of levels in the coach qualification structure	5	4	5	3	3
Number of coaches who receive a monthly wage to be a professional coach	13	12	80	9	2
Number of international athletics championships organized in the past 10 years	6	2	2	2.5[a]	0.5[a]
Number of Top 8 performances at World Championships and Olympic Games between 2005 and 2012	30	16	16	13	5

Note. ORFOC = organizational resources and first-order capabilities; CAN = Canada; NED = the Netherlands; FIN = Finland; FLA = Flanders; WAL = Wallonia; NSO = national sport organization.

[a]As the World Cross Country Championship was organized in Brussels by the Belgian Athletics Association, both Flanders and Wallonia obtain a 0.5 score for organizing this event.

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 centralized 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 centralized programs, and elite athletes in these three systems receive personal financial support. In fact, compared with the Netherlands and Canada, Finland and Flanders place a key emphasis and have better structured *youth participation* and *talent identification and development* programs. The NSOs 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 NSO 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 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) represent strong resource configurations for talent identification and development. In Wallonia, the NSO 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 *prioritize* their funding to *specific disciplines*. Hence, strategic priorities can determine resource configurations. Data from the inventory (e.g., Resource 2.2: priority support to successful or popular disciplines in athletics) show that in Canada, program-based support was focused on sprints and relays, selected technical events, and middle-distance running (800 m and 1,500 m). In the Netherlands, central training programs were organized for joint events, distance running, shot put/discus and pole vault. Finland, Flanders, and Wallonia had an egalitarian approach (i.e., nonprioritizing 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 specialized training camps dedicated to javelin were unique organizational resources devoted to javelin throwers. As the data in Table 3 earlier indicated, success in the Netherlands and Canada is widespread over many disciplines even though they focus on specific disciplines.

Part 3: Resource Dependencies

The results show that Finland and the Netherlands depend on resources or support programs provided by external organizations or TPOs. Specifically, strong resource dependencies can be found in *athlete development.* This is because elite sport schools for young talented athletes are organized 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 NSO. 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 are not coordinated or supported by the NSO. In the Netherlands, the Topsport Talent schools and the Atletiekunie provide different pathways for athletes toward a high-performance status: Topsport Talent schools provide educational support services to athletes with a national Dutch Olympic Committee and National Sport Federation (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 NSO 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 organizations that are affiliated with the NSO. National programs or practices organized by the NSO are showing in circles. Elite programs offered outside the NSO (e.g., Own the Podium in Canada) and/or non-sport-specific organizations (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 is the strong dependencies that exist on TPOs, particularly regarding *training and competition facilities.* NSOs in athletics appear to depend on national, regional government, or other sport organizations 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 200-m track until, in collaboration with national partner organizations, including NOC*NSF, they constructed Omnisport Apeldoorn in 2008. Both sport systems used the indoor competition facilities of Flanders to organize

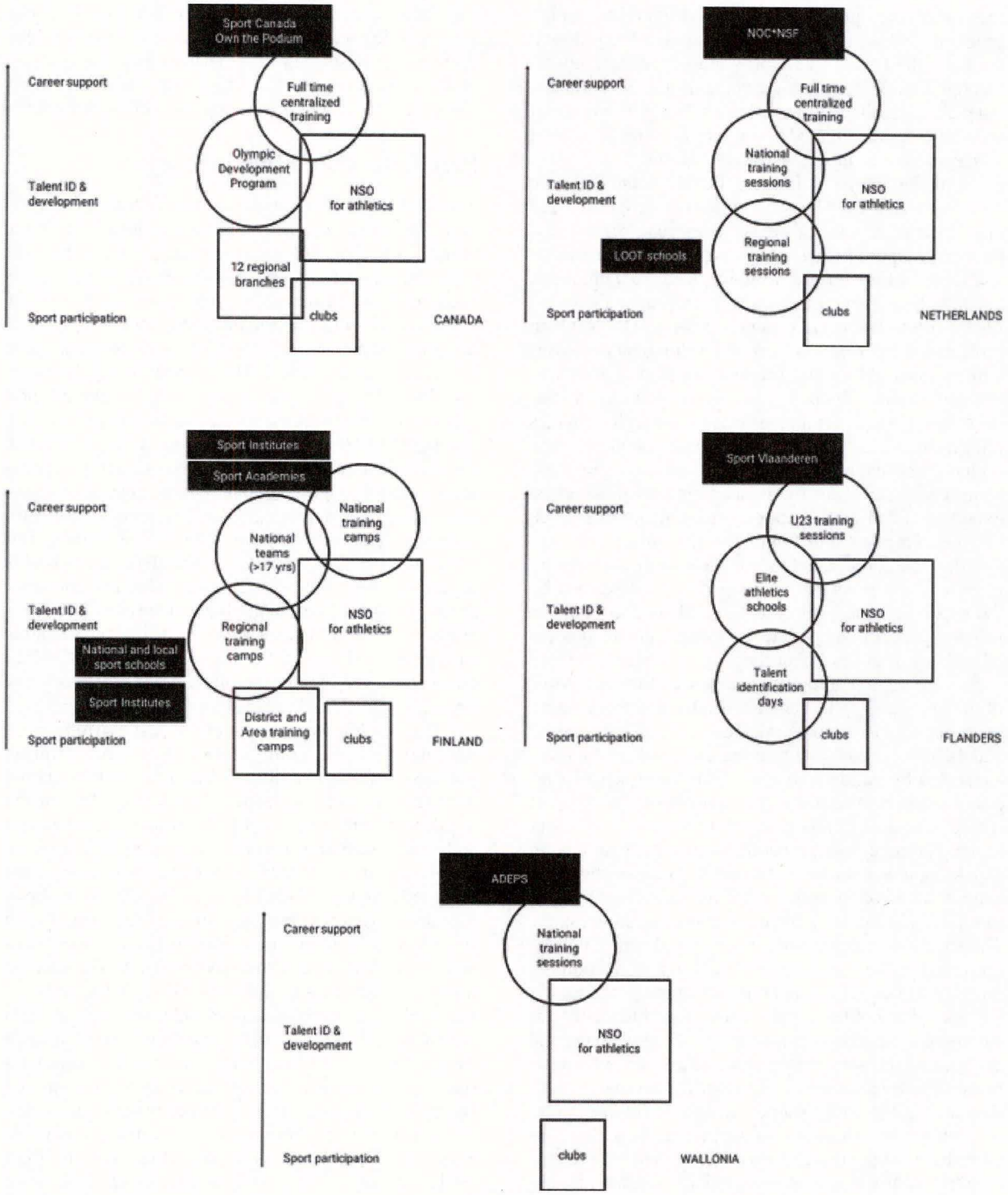

Figure 2 — Resource configurations for athletics. *Note*. Organizations affiliated with the national sport organization (NSO; i.e., regional departments for athletics and athletics clubs) are represented by white squares. Elite programs offered outside the NSO (e.g., "Own the Podium" in Canada) and/or non-sport-specific organizations (e.g., institutes of sport and Olympic Committees) are represented in black rectangles. NOC*NSF = Dutch Olympic Committee and National Sport Federation; LOOT = talent school for elite sport; BLOSO = Flemish sport agency; ADEPS = Wallonian sport agency.

training programs and indoor competitions. Since 2008, most elite athletes have trained in the national training center, Papendal, or the regional training center Sittard (especially for pole vaulters). Flanders has an indoor competition track that is funded by the national sport agency Bloso, which is used as an elite training center, 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 organizations and not coordinated by the NSO.

Another point to note, with reference to Figure 2, is the *multiple organizations* 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 organizations (e.g., clubs and NSOs) and various talent identification and development programs (e.g., district organized training camps). In addition, districts (21 districts supported by Finnish Athletics) and the area organizations 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 Implications

This paper identified and evaluated the organizational 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 scores show that there is a variance between the five sport systems regarding the development of organizational 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 organize 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 organizational resources are allocated. For instance, sport systems vary in relation to the level of *centralization* of training programs, the emphasis placed on different *levels of athlete development*, and the *prioritization* of specific athletics disciplines over others. While Canada and the Netherlands provide centralized training programs for elite athletes, Finland, Flanders, and Wallonia support their elite 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 (e.g., Sam, 2012). Flanders and Finland allocate more organizational resources on sport participation and programs for talent identification and development at grassroots levels. These findings illustrate countries' organizational capacity to combine and deploy their resources and the ways they allocate them across specific practices. As Gerrard (2003) stressed, knowledge of the ways countries leverage resources to achieve elite sport success and gain a competitive advantage helps us understand countries' competitive position.

The findings in this study respond to several calls for further examination of the ways specific sports organize and align resources and policies (De Bosscher et al., 2015; Oakley & Green, 2001; Truyens et al., 2014) and have various practical and theoretical 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 organizational resources framework, the ORFOC framework (Truyens et al., 2014), into a tool that measures and evaluates sport- and country-specific organizational resources, capacities, and resource configurations. Hence, this study offers a more dynamic framework that helps identify and evaluate countries' organizational capacity to allocate resources. In addition, the use of multiple countries offered the opportunity to draw comparisons between countries' resource development and configurations. These comparisons are important as they permit countries to examine the organization and alignment of resources and policies (Truyens et al., 2014) and explore how their resources and their configurations affect each other to produce results (Winand et al., 2012).

These comparisons help in understanding how countries develop strategy from specific resources and capabilities and pose significant practical implications for high performance managers and elite sport policy makers. Specifically, even though Finland had the best index scores, it was not successful in tailoring organizational resources in a coordinated elite sport system that would ultimately result in significant levels of international sporting success. This leads us to conclude that possessing organizational 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 organizational 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. Realizing this potential requires alignment with other organizational 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 centralized approach to training athletes, (b) the availability of

talent development programs at the top level of athlete development stages, and (c) the targeting of specific disciplines within athletics provided a successful resource configuration for Canada and the Netherlands that aligned organizational resources strategically. Consistent with Fahy's (2000) work, the alignment of organizational resources into resource configurations contributes to the development of competitive advantage for Canada and the Netherlands.

In addition to aligning organizational resources strategically, Canada and the Netherlands also scored generally well (although second to Finland) on the different dimensions (as represented by the index scores in Table 2). Canada and the Netherlands are most efficient in deploying resources by constructing organizational systems that may enhance sporting success and improve performance levels for a longer term (see Figure 1). Such successful outcomes reiterate Hoye, Smith, Nicholson, and Stewart's (2012) suggestion that there are links between the matching of an organization's activities to its resource capabilities and the influence of strategic decisions on the long-term direction and success of the organization. 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. This could be especially true in Finland, Flanders, and Wallonia, where there was evidence of structural NSO dependencies on other national and regional governments or sport organizations. According to the literature, dependency decreases the autonomy of organizations (Pfeffer & Salancik, 1978) and limits 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 potentially limit an organization's capacity.

Future Research

The combination of *composite indicators* and the analysis of the resource *configurations* that was applied in this study assisted in drawing the conclusion that while high index scores represent a good level of development of organizational resources, resource configurations provide evidence of a country's capacity to combine organizational resources in national elite practices. This information may prove to be useful when planning strategically for high performance sport and future success. Building on this study, further research would help explain the relation between resource configurations and the development of a competitive advantage in elite sport. However, besides organizational practices, other factors that were not included in this study, like social, cultural, and macrolevel factors, impact a country's sporting success (Bernard & Busse, 2004). In addition, Dimension 10 (elite sport environment) was not included in the analysis in this study. Hence, the added value of the elite sport environment to organizational capacity remains unknown, and it presents an opportunity for further research. Furthermore, a country's competitive advantage is not determined only by its own capacity or productivity; it is also limited by the power of its rivals (Porter, 1990). An analysis of the competitive balance or rivalry within specific sports could provide a deeper understanding of the effectiveness of nations' strategy in their attempt to obtain international sporting glory.

This study helps in understanding the ways countries structure, combine, and align resources and capabilities. However, 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 use 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 to maintain a competitive advantage. 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, and using various sports. An analysis of more countries could provide supporting evidence on the correlation between countries' organizational capacities and their level of international sporting success.

Notes

[1]Flanders and Wallonia have independent sport policy structures and separate organizations for specific sports. As such, these regions are independent jurisdictions for sport and each has an NSO for athletics. Flanders NSO is the Vlaamse Atletiekliga, and Wallonia s NSO is Ligue Belge Francophone d Athlétisme. Only during international competitions, athletes from both systems represent the Royal Belgian Athletics Association or the Belgian Olympic Committee (BOIC/COIB). For the purposes of brevity and simplicity of this paper, these five jurisdictions are referred to as countries or elite sport systems.

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Appendix

Overview of the Scoring for "Financial Support," "Talent Identification and Development," and "Coach Provision and Development"

Dimension 1: Financial support (measured using 7 resources and 16 indicators)		R[a]	CAN	NED	FIN	FLA	WAL
1.1	**Government funding for athletics**[b]	**2**	**.63**	**.59**	**.69**	**.61**	**.57**
	Total national government funding for athletics	1	1	.24	.27	.51	.24
	Total national government funding for athletics per capita	2	.36	.18	.62	1	.84
	The proportion of funding for the NSO in athletics compared with the funding for all NSOs	1	1	.83	.62	.39	.90
	Changes to the national budget for athletics (2005–2009)	1	.79	1	.71	.89	.86
	Total national budget for athletics	2	.46	.84	1	.25	.15
1.2	**NSO's private financial resources**	**1**	**.12**	**.72**	**1**	**.10**	**.05**
	NSO's private financial resources	1	.12	.72	1	.10	.05
1.3	**NSO's commercial financial resource**	**2**	**.12**	**.09**	**1**	**.12**	**.01**
	NSO's commercial financial resources	1	.12	.09	1	.12	.01
1.4	**Partnership or commercial agreement with media agencies**	**1**	**1**	**1**	**1**	**.00**	**.00**
	There is a partnership or commercial agreement between the NGB and media agencies	1	1	1	1	.00	.00
1.5	**Targeted government funding for mass participation**	**1**	**.05**	**.60**	**1**	**.05**	**NA**
	Total national government funding for mass participation	1	.09	.91	1	.06	NA
	Total national government funding for mass participation per capita	1	.01	.29	1	.05	NA
1.6	**Targeted government funding for elite athletics**	**3**	**.76**	**.60**	**.53**	**.58**	**.57**
	Total national funding for elite athletics	2	1	.70	.56	.40	.24
	Total national funding for elite athletics per capita	2	.42	.79	.79	1	1
	Collective expenditure for elite athletics	2	1	.31	.42	.45	.25
	Changes on the overall expenditure for elite athletics (2005–2009)	1	.73	.50	.80	.62	1
1.7	**Government funding for athletics clubs**	**1**	**.50**	**1**	**.50**	**.50**	**.50**
	Athletics clubs receive government funding for services and training programs (Y/N answer)	1	.00	1	.00	.00	.00
	Regions or states provide government funding for services and training programs (Y/N answer)	1	1	1	1	1	1
Final weighted index score for Dimension 1: Financial support			**52.04**	**52.78**	**79.78**	**32.86**	**30.84**

Dimension 4: Talent identification and development (measured using 16 resources and 55 indicators)		R	CAN	NED	FIN	FLA	WAL
4.1	**A national talent identification and development plan**	**3**	**.71**	**.78**	**.60**	**.89**	**.63**
	The organization of talent identification and development is incorporated in a national sport policy plan (Y/N answer)	2	1	1	1	1	1
	The policy plan includes different organizational characteristics for talent identification and development (Y/N answers on 17 organizational characteristics)	3	.24	.41	.59	.71	.00
	NSOs are obliged to write a sport policy plan on talent identification and development (Y/N answer)	1	1	1	1	1	1
	The availability and quality of the policy plan influences the amount of financial support for the NSO (Y/N answer)	2	1	1	.00	1	1
4.2	**Discipline-specific talent development plans**	**3**	**.79**	**.98**	**.76**	**.50**	**.00**
	The NSO for athletics develops national talent development plans (Y/N answer)	2	1	1	1	1	.00
	There are discipline-specific talent development plans (Y/N answers on nine organizational characteristics)	1	1	.78	.89	.67	.00

Dimension 4: Talent identification and development (measured using 16 resources and 55 indicators)	R	CAN	NED	FIN	FLA	WAL
The national talent development plans includes different organizational characteristics on talent development (Y/N answers on 10 organizational characteristics)	3	.30	1	.90	.10	.00
The talent development plans are available online (Y/N answer)	2	1	1	.00	.00	.00
The talent development plans are communicated to young athletes and coaches (Y/N answer)	2	1	1	1	1	.00
4.3 A school-level detection test for young talents	**2**	**.00**	**1**	**.00**	**.67**	**.00**
There is a national cooperation between educational agencies and the national sport organization for talent detection in primary and secondary schools (Y/N answer)	2	.00	1	.00	1	.00
The NSO for athletics supports athletics clubs to cooperate with local schools regarding the detection of young potentials in athletics (Y/N answer)	1	.00	1	.00	.00	.00
4.4 A national standardized test battery for children's physical fitness (non-sport-specific)	**2**	**.00**	**.00**	**.00**	**1**	**.00**
There is a national battery of physical fitness tests to measure children's sporting potential (Y/N answer)	1	.00	.00	.00	1	.00
The different tests in the battery of physical fitness tests are published online (Y/N answer)	1	.00	.00	.00	1	.00
4.5 A longitudinal database on the results of the physical fitness tests	**2**	**.01**	**.35**	**.00**	**.69**	**.00**
The results of the battery of physical fitness tests are stored in a database and used in the talent detection process (Y/N answer)	1	.00	.00	.00	.00	.00
The NSO for athletics stores the results fitness tests specifically for athletics in a database and uses the data in the athletics talent detection process (Y/N answer)	1	.00	1	.00	1	.00
The NSO for athletics has its own database with specific battery test results from former or current elite athletes (Y/N answer)	1	.00	1	.00	1	.00
The different criteria and characteristics are included in the database for battery test results for athletics (Y/N answers on 13 organizational characteristics)	1	.08	.08	.00	.15	.00
The results of the battery tests of former and current elite athletes are used to develop specific criteria in the talent detection and identification process (Y/N answer)	2	.00	.00	.00	1	.00
4.6 A club-level battery of physical fitness tests for athletics	**2**	**.29**	**.71**	**.29**	**1**	**.00**
There is a specific battery of physical fitness tests to measure the athletics potential of children in athletics clubs (Y/N answer)	2	.00	1	1	1	.00
Athletics clubs and coaches receive detailed guidelines about the use of the test battery (Y/N answer)	1	.00	1	.00	1	.00
There is a specific battery of physical fitness tests to measure athletics potential of children used in a regional/state-level talent selection process (Y/N answer)	2	1	.00	.00	1	.00
The different tests in the batteries are nationally standardized (Y/N answer)	1	.00	1	.00	1	.00
The different tests in the test batteries for athletics are published online (Y/N answer)	1	.00	1	.00	1	.00
4.7 A scouting system for talent detection and identification	**1**	**1**	**1**	**1**	**1**	**.00**
The NSO for athletics appoints coaches for scouting talented young athletes (Y/N answer)	1	1	1	1	1	.00
4.8 Individual development pathways (support programs) for talented athletes	**2**	**1**	**1**	**.00**	**1**	**.00**
The NSO for athletics develops individual development pathways for talented young athletes (Y/N answer)	1	1	1	.00	1	.00
4.9 National/regional talent pools and training camps for different age groups	**2**	**.61**	**.73**	**.86**	**.92**	**.76**
There are different talent pools of talented young athletes in athletics (Y/N answer)	2	.00	1	1	1	1
Junior-level athletes (U20) in different talent pools receive financial support (Y/N answer)	1	1	.00	1	1	1
U23-level athletes in the talent pools receive financial support (Y/N answer)	1	1	1	1	1	1
Talented young athletes receive age-appropriate training and competition support (Y/N answers on 30 organizational characteristics)	3	.70	.73	.80	.92	.58
Talented young athletes receive medical and paramedical support (Y/N answers on 25 organizational characteristics)	1	.70	.67	.68	.83	.67
Talented young athletes receive athlete career support (Y/N answers on 25 organizational characteristics)	1	.70	.70	.67	.73	.40
4.10 Discipline-specific talent development plans in secondary/tertiary education	**2**	**.00**	**.00**	**.00**	**.00**	**.00**
There are specific talent development plans for talented young athletes in secondary education (Y/N answer)	1	.00	.00	.00	.00	.00
There are specific talent development plans for talented young athletes in tertiary education (Y/N answer)	1	.00	.00	.00	.00	.00

Dimension 4: Talent identification and development (measured using 16 resources and 55 indicators)	R	CAN	NED	FIN	FLA	WAL
Talent development plans for secondary/tertiary education are coordinated by the NSO for athletics (Y/N answer)	1	.00	.00	.00	.00	.00
4.11 Specific coordinated selection criteria for regional/national talent pools	**2**	**.50**	**.83**	**.83**	**.83**	**.83**
There are different selection criteria for the different pools of talented young athletes (Y/N answer)	2	1	1	1	1	1
There are specific selection criteria for talented young athletes to stay involved in the talent groups (Y/N answer)	1	1	1	1	1	1
Talented young athletes who do not meet the selection criteria are followed during their further development by the NSO (Y/N answer)	1	.00	.00	.00	.00	.00
The support services for talented young athletes are nationally coordinated (so no overlap takes place) (Y/N answer)	2	.00	1	1	1	1
4.12 A national talent status for upcoming athletes	**1**	**.22**	**.56**	**1**	**.59**	**.49**
There is a national talent status that offers talented young athletes the flexibility to combine elite career and studies, access to special facilities and programs (Y/N answer)	1	1	1	1	1	1
There are education support services for national talent status athletes (Y/N answers)	2	.00	.57	1	.86	.71
The number of talented young athletes with a national talent status in 2009–2010	2	.05	.33	1	.12	.00
4.13 Athletics schools in secondary education provide opportunities to combine study and sport development	**1**	**0**	**1**	**1**	**1**	**.00**
There is system for the combination of elite development in athletics and secondary education (Y/N answer)	3	.00	1	1	1	.00
There are different organizational structures for the combination of elite athletics and (secondary) education (Y/N answer)	1	NP	1	1	1	.00
Schools with elite sport facilities provide different sporting opportunities at a high performance level (Y/N answer)	1	NP	1	1	1	NP
Young talented athletes in elite athletics schools stay and sleep on the campus ground (boarding schools) (Y/N answer)	1	NP	1	1	1	NP
There is a national quality management system for the NGB and the quality and operations of the elite athletics schools (Y/N answer)	1	.00	1	1	1	.00
4.14 Educational support programs for talented athletes in secondary education	**3**	**.00**	**.67**	**1**	**.67**	**.00**
Athletes in elite athletics schools can make use of different study flexibilities (Y/N answers based on six organizational characteristics)	1	.00	.83	1	.83	.00
There are sufficient academic study opportunities in the elite athletics schools (Y/N answers based on three organizational characteristics)	1	NP	.50	1	.50	NP
4.15 Athletics schools in higher education to combine study and sport development	**1**	**.71**	**.88**	**.75**	**.92**	**.29**
The educational support services for elite athletes at colleges and universities are nationally coordinated (Y/N answer)	2	1	1	1	1	.00
Colleges and universities provide additional support services to support the combination of elite athletics and education (Y/N answers on six organizational characteristics)	1	.50	.67	.33	.83	.50
Colleges and universities provide individual support services and programs for elite athletes (Y/N answers on six organizational characteristics)	1	.33	.83	.67	.83	.67
4.16 Flexible educational programs for athletes in secondary/tertiary education	**1**	**.10**	**.17**	**.11**	**.19**	**.11**
Training support services at colleges and universities for high performance athletes are nationally coordinated (Y/N answer)	2	.00	.00	.00	.00	.00
There are specific training support services provided at colleges and universities for elite athletes (Y/N answers on seven organizational characteristics)	1	.71	.71	.29	.43	.29
The NSO for athletics cooperates with colleges and universities to provide specific training support for a discipline group of athletes (Y/N answer)	1	.00	.00	.00	1	.00
There is financial support for higher education stakeholders for the development of elite athletes (Y/N answers on three organizational characteristics)	1	.00	.33	.33	.67	.33
Final weighted index score for Dimension 4: Talent identification and development		**47.35**	**74.49**	**53.57**	**81.80**	**23.97**

Dimension 7: Coach provision and development (measured using 16 resources and 45 indicators)	R	CAN	NED	FIN	FLA	WAL
7.1 One national organization for the coordination and organization of elite and non-elite coach development	**2**	**.80**	**1**	**.00**	**1**	**.80**

Dimension 7: Coach provision and development (measured using 16 resources and 45 indicators)		R	CAN	NED	FIN	FLA	WAL
	There is a national coordinating organization responsible for the development of elite and non-elite coaches (Y/N answer)	3	1	1	.00	1	1
	The number of qualification levels and the certification process of different sports is nationally coordinated (Y/N answer)	1	1	1	.00	1	1
	The national qualification framework is evaluated in regard to an international qualification framework (Y/N answer)	1	.00	1	.00	1	.00
7.2	**A national coach qualification framework in athletics**	**2**	**.60**	**.80**	**1**	**.60**	**.60**
	The NSO for athletics organizes the coach qualification framework for the athletics coaches (Y/N answer)	3	1	1	1	1	1
	The NSO for athletics makes use of other national and international coach qualification frameworks to develop elite athletics coaches (Y/N answer)	1	.00	1	1	.00	.00
	The courses of the different qualification levels are yearly organized (Y/N answer)	1	.00	.00	1	.00	.00
7.3	**A compulsory system to keep the coach qualification up-to-date and valid**	**1**	**.00**	**1**	**.00**	**.00**	**.00**
	There is a national compulsory system to keep the coach qualification up-to-date and valid (Y/N answer)	1	.00	1	.00	.00	.00
7.4	**A qualification level especially for the development of elite coaches in athletics**	**3**	**.86**	**.86**	**.57**	**.57**	**.43**
	There is a qualification level especially for the development of elite coaches in athletics (Y/N answer)	2	1	1	.00	.00	.00
	Former elite athletes can enter into a short track qualification course to become an elite coach (Y/N answer)	1	1	1	1	1	1
	There is an increasing specialization through the elite athletics development process (Y/N answer)	1	1	1	1	1	.00
	There is a close cooperation with elite athletics or the NSO for athletics through the development of elite coaches (Y/N answer)	1	1	1	1	1	1
	There are national coaches involved with the elite coach qualification levels (Y/N answer)	1	1	1	1	1	1
	There are international coaches involved with the elite coach qualification levels (Y/N answer)	1	.00	.00	.00	.00	.00
7.5	**Specific criteria to participate in elite qualification levels**	**1**	**1**	**1**	**1**	**1**	**1**
	There are specific criteria required to participate in the elite qualification levels (Y/N answer)	1	1	1	1	1	1
7.6	**A short track qualification course for former high performance athletes**	**2**	**.00**	**1**	**1**	**.00**	**.00**
	Elite coaches without formal qualification level can enter into a short track qualification course (Y/N answer)	1	.00	1	1	.00	.00
7.7	**National athletics coaches and/or sports scientists**	**2**	**1**	**.47**	**.39**	**.40**	**.07**
	The number of qualified coaches in athletics	1	1	.42	.67	.40	.02
	The number of elite coaches in athletics	2	1	.50	.25	.40	.10
7.8	**Courses and clinics for the continuous development of coaches**	**1**	**.50**	**.80**	**.30**	**.80**	**.60**
	There are specific services for elite athletics coaches to improve their level of expertise (Y/N answers)	1	1	.60	.60	.60	.20
	Elite coaches have sufficient formal and informal occasions to communicate with the NSO about their personal development and the development of elite athletes (Y/N answer)	1	.00	1	.00	1	1
7.9	**A national mentoring scheme for elite coaches**	**1**	**.00**	**.50**	**.75**	**.50**	**.00**
	There is a national mentoring scheme for elite coaches (Y/N answer)	2	.00	1	1	1	.00
	There are national elite coaches appointed to mentor other elite coaches to improve their level of expertise (Y/N answer)	1	.00	.00	1	.00	.00
	There are international elite coaches appointed to mentor other elite coaches to improve their level of expertise (Y/N answer)	1	.00	.00	.00	.00	.00
7.10	**Centralized discipline-specific meetings for elite coaches**	**1**	**.25**	**1**	**1**	**.75**	**.75**
	The NSO for athletics has regular performance interviews with their elite coaches (Y/N answer)	1	1	1	1	1	1
	The NSO for athletics has regular performance interviews with personal coaches of elite athletes (Y/N answer)	2	.00	1	1	1	1
	The NSO for athletics has regular meetings with discipline-specific coaches to evaluate or plan performance development (Y/N answer)	1	.00	1	1	.00	.00
7.11	**A national coordinated system of talent identification for coaches**	**1**	**.00**	**.00**	**.00**	**.00**	**.00**
	There is a national coordinated system of talent identification for coaches (Y/N answer)	1	.00	.00	.00	.00	.00
7.12	**A mandatory coach qualification level for clubs**	**1**	**1**	**.50**	**.00**	**.00**	**.00**

Dimension 7: Coach provision and development (measured using 16 resources and 45 indicators)		R	CAN	NED	FIN	FLA	WAL
	The NSO for athletics postulates a minimum qualification level for coaches working with young talented athletes (Y/N answer)	1	1	1	.00	.00	.00
	The NSO for athletics postulates a minimum qualification level for coaches working with elite athletes (Y/N answer)	1	1	.00	.00	.00	.00
7.13	**Direct financial support for elite coaches**	**2**	**.19**	**.26**	**.64**	**.50**	**.48**
	Number of elite coaches who receive direct financial support to be a professional/full-time coach	2	.16	.15	1	.11	.03
	The type and amount of financial support elite coaches can receive (Y/N answers)	2	.40	.40	.40	.40	.40
	The different costs which are covered by the reimbursement of expenses (Y/N answers)	2	NA	.50	.67	.50	.50
	Elite coaches are able to earn additional (commercial) financial support apart from their wage (Y/N answer)	1	.00	.00	1	1	1
	Elite coaches receive bonuses after successful international competitions (Y/N answer)	1	.00	.00	.00	1	1
7.14	**A postcoaching career support program**	**1**	**.00**	**.33**	**.33**	**.00**	**.00**
	The NGB for athletics has an active policy regarding the employers of elite coaches who are not full-time-equivalent appointed (Y/N answer)	1	.00	.00	1	.00	.00
	There is a national sport organization responsible for the postcoaching career support of elite coaches (in athletics) (Y/N answer)	1	.00	1	.00	.00	.00
	The NGB for athletics cooperates with a recruitment and selection organization to support elite coaches in their postcoaching career (Y/N answer)	1	.00	.00	.00	.00	.00
7.15	**A legal statute for elite coaches**	**1**	**.00**	**.50**	**.60**	**.40**	**.40**
	There is a legal statute for elite coaches in your country which recognizes and supports their job status (Y/N answer)	1	.00	1	.00	.00	.00
	There is a legal charter for all sport coaches (Y/N answer)	1	.00	1	.00	.00	.00
	There is a national coaches association in athletics (Y/N answer)	1	.00	.00	1	1	1
	The national coaches association is a member of an international coaches association in athletics (Y/N answer)	1	NP	NP	1	1	1
	There is a national trade union for coaches which represents all employees and coaches working in sport (Y/N answers)	1	.00	.00	1	.00	.00
7.16	**A support system for jury development**	**1**	**1**	**1**	**.75**	**.75**	**.75**
	There is a national development structure for jury members (Y/N answer)	1	1	1	1	1	1
	The NGB for athletics provide educational structures and additional courses and support for jury members (Y/N answer)	1	1	1	.00	1	1
	Jury members regularly need to reeducate themselves (Y/N answer)	1	1	1	1	.00	.00
	Jury members receive financial support for their work in athletics (Y/N answer)	1	1	1	1	1	1
Final weighted index score for Dimension 7: Coach provision and development			**51.14**	**70.77**	**54.38**	**47.47**	**37.82**

Note. CAN = Canada; NED = the Netherlands; FIN = Finland; FLA = Flanders; WAL = Wallonia; NSO = national sport organization; NGB = national governing body; NA = not available; NP = not applicable. NP can be assigned to indicators describing specific organizational characteristics of previous indicators with a 0 score.

[a]Specific ratings (R) are provided for all resources (bold) and indicators to differentiate according to their level of importance. Ratings are provided based on expert review. [b]Scores for organizational resources represent the weighted average for the accumulated scores of the indicators.