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An examination of the stakeholders and elite athlete development pathways in tennis

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Research question: The research questions that guided this investigation were (1) ‘What are the roles of sport development stakeholders in elite player development pathways?’ and (2) ‘How are those elite pathways modelled in tennis?’

Research methods: Data from 18 semi-structured in-depth interviews with international tennis experts were thematically analysed to explore stakeholder involvement and how their interactions and strategies shape elite tennis pathways.

Results and findings: The results show that during the *attraction/retention* process of elite sport development national tennis associations (NTAs) are responsible for initiating programmes that local clubs and coaches deliver. During the *talent identification and selection* process NTAs, clubs and coaches cooperate to identify talent. Throughout the *talent development* process, tennis players progress from clubs to NTA training centres or private academies. Last, during the *nurturing* process, NTAs support players in the transition from junior to senior level and once players are self-sufficient, the NTA support decreases.

Implications: These findings offer empirical evidence on the roles of stakeholders and their support to players in shaping development pathways in tennis. The shift in stakeholder dynamics and variation in their roles and relationships suggests that stakeholders can have different levels of involvement depending on the developmental process. These results help draw meaningful practical implications. For instance, the heightened role of local clubs during most of the sport development processes points towards the need to revisit the level of support clubs receive and their capacity to deliver optimal developmental pathways.

Keywords: Elite sport development; pathways; sport clubs; national sporting organisations; sport development stakeholders

Introduction

Many national sporting organisations (NSOs), or else sports federations or national sports governing bodies, are largely financially dependent on government funding (Berrett & Slack, 2001; Green & Houlihan, 2006; Winand, Rihoux, Robinson, & Zintz, 2013). Government funding to NSOs is often performance based (Sam, 2012; Sotiriadou, Quick, & Shilbury, 2006) and driven by athlete results at the Olympic Games or other international and world sporting competitions (e.g. De Bosscher,

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Shibli, Westerbeek, & van Bottenburg, 2015; Green & Houlihan, 2006; Green & Oakley, 2001). The need to continually deliver success has over the years encouraged NSOs to closely improve their sport development practices and elite pathways and formulate sport development plans and strategies (Sotiriadou, 2013).

As a result, many sports utilise the sport development pyramid (Eady, 1993) or the long-term athlete development (LTAD) framework (Balyi & Hamilton, 2004) as platforms to design their elite development pathways (e.g. Canadian Sport Institute, 2014; Ford et al., 2011; Lang & Light, 2010). Despite the popularity of these sport development platforms, evidence suggests that the sport development pyramid is a metaphor that does not cover the full sport development processes (Bailey et al., 2010; De Bosscher, Sotiriadou, & van Bottenburg, 2013). Also, the LTAD framework is mainly a coaching tool (Ford et al., 2011) that is based on general principles from the physical training, physiology, and motor learning literature (Holt, 2010). There is a plethora of other athlete development frameworks that highlight various key features or development stages of athlete progress depending on the disciplinary background (e.g. Bloom, 1985; Côté & Fraser-Thomas, 2007; Wylleman & Lavalée, 2004). Most of these frameworks start from an athlete perspective (i.e. micro-level) and identify how factors like training load, motor skill development, specialisation, coach and parent involvement, and academic levels change during the different phases and transitions of athlete development. These frameworks do not offer an insight from an organisational or management perspective (i.e. meso-level) that would explain how sport organisations develop or support the different sport development stages (Sotiriadou & Shilbury, 2009, 2013). Moreover, these frameworks overlook ‘who is involved with sport development, in what ways they are involved, and with what outcomes’ (Sotiriadou & Shilbury, 2013, p. 144). Consequently, there is a gap between athlete development models (i.e. micro-level) and what these models denote in practical terms at the organisational level to NSOs, clubs and other stakeholders (i.e. meso-level) (Greyson, Kelly, Peyrebrune, & Furniss, 2010). Moreover, given the complexity of elite sport development pathways, generic talent development frameworks are inadequate to reflect sport specific pathways (Greyson et al., 2010; Sotiriadou, Shilbury, & Quick, 2008).

In response to these gaps, this study examines elite development in tennis and the role of various stakeholders in supporting sport development processes. Specifically, this study used the attraction, retention, transition and nurturing (ARTN) framework (Sotiriadou et al., 2008) to explore the roles that tennis stakeholders play in initiating or delivering programmes and strategies. The ARTN framework was chosen because it offers a managerial and organisational approach (i.e. meso-level) to studying elite athlete development. The two research questions that guided this investigation were: (1) ‘What are the roles of sport development stakeholders in elite player development pathways?’ and (2) ‘How are those elite pathways modelled in tennis?’ The findings extend the application of the ARTN framework in a sport specific setting and add an understanding on the role of stakeholders and their player support in shaping elite development pathways in tennis.

Sport development stakeholders

Sport development stakeholders and the athlete development strategies they initiate or implement enable the athlete’s entrance or introduction to sport, their retention or

choice to continue to participate, and their advancement to higher levels of training and competitions (Green, 2005; Sotiriadou, 2013). Sport development stakeholders range from governments and statutory authorities, to sport organisations, and significant others such as athletes, coaches and sponsors (Sotiriadou et al., 2008). Evidence suggests that the role of these stakeholders varies as some of them (e.g. governments, NSOs) initiate or shape sport development strategies, whilst others (e.g. sport development officers, coaches, sport managers) implement them (Sotiriadou, 2009). For example, at the federal government level the sports commission in Australia sets the policy direction and coordinates delivery mechanisms to ensure the achievement of outcomes (Green & Houlihan, 2006). Such national policy- or performance-based directions set NSOs under increasing pressures to develop strategic elite athlete development programmes and well performing athletes (Berrett & Slack, 2001; Sam, 2012).

At a local level, the role of sports clubs, as a key stakeholder in offering opportunities to participate in sport, is illustrated through the plethora of programmes they offer with modified equipment and competition formats for tennis participation (e.g. Anderson, 2010; Declercq, 2010; Miley, 2010). As young players engage in fun and social activities, certain club coaches or national tennis associations (NTAs) may engage in identifying talented players, as young as six years old, with the potential to become elite players (Pankhurst, 2013). Then, NTAs fund talent development programmes and competitions that facilitate player transition from local to state or national and international competitions and from junior to senior levels (Green, 2005; Sotiriadou et al., 2008).

Even though local clubs and NSOs, among other stakeholders, play a significant role in the development of elite athletes, the commercialisation of high performance sports, has led to the creation of other stakeholders, such as profit-driven event management companies (e.g. Phillips & Newland, 2014) and private academies (e.g. Webb, 2013) that cater for elite athletes. For example, in Australia and the USA triathlon depends on third party organisations (i.e. profit-driven event management companies) for the delivery of events and the development of the sport at the elite level (Newland & Kellett, 2012). Liebenau (2010) noted that in golf, private colleges and independent coaches and academies provide pathways to elite level, independently from the Golf Queensland (i.e. the state sport organisation) development programme. In tennis, the private tennis sector offers highly professionalised and commercialised training centres and high performance academies that provide complete player pathways from talent identification to elite level (Brouwers, Sotiriadou, & De Bosscher, 2015; Webb, 2013). Private tennis academies often strive for profit maximisation and complement (or sometimes undermine) the role of the NTA activities in talent identification and development programmes (Houlihan, 2013).

Elite athlete development strategies

For sport development stakeholders to successfully deliver elite athlete development outcomes, including success at national and international sporting events, a strategic approach to elite athlete development is necessary (De Bosscher, De Knop, & van Bottenburg, 2009). Consequently, researchers have focused on identifying the elite development strategies, policies, services or resources that contribute to successful elite athlete development (e.g. Böhlke & Robinson, 2009; De Bosscher, De Knop, van Bottenburg, & Shibli, 2006; De Bosscher, De Knop, van Bottenburg, Shibli, & Bingham, 2009;

Digel, Burk, & Fahrner, 2006; Truyens, De Bosscher, Heyndels, & Westerbeek, 2014). Examples of sport development strategies or services that contribute to elite athlete development include development programmes, facilities, coaches, promotions, competitions or events, talent identification, talent development and athlete support. Even though there is consent among sport policy researchers on the factors that should be provided to develop elite athletes, 'little is known about how sport systems should manage their elite services' (Böhlke & Robinson, 2009, p. 70) or how stakeholders provide these strategies and services to shape the pathways that develop elite athletes. To assist in their strategic planning and the delivery of elite athlete development, NSOs, including NTAs, develop high performance plans or player development pathways (e.g. Tennis Canada, 2013; Vlaamse Tennis Vereniging, 2009). These include strategies on, for example, the competition structure, high performance pathways, training requirements, financial support programmes, and talent identification.

Even though sport policy researchers have showed that talent identification has become a key component of national elite sport development systems (e.g. De Bosscher et al., 2006; Green & Oakley, 2001), research highlights various issues with talent identification being used as an ex-ante prediction of talent and future success (e.g. Abbott & Collins, 2002; Green, 2005; Vaeyens, Lenoir, Williams, & Philippaerts, 2008). For example, Green (2005) argued that 'the limitations of our technologies for long-range forecasting of individual potentials counsel against an elite performance system based solely on early identification and conscription' (p. 236). Moreover, the absence of agreed, measurable, and objective criteria applied during talent identification has resulted in using competition results and the coaches' 'eye' as measures to identify talent in many sports (Brouwers, De Bosscher, & Sotiriadou, 2012; Lyle, 1997). Despite the plethora of studies on talent identification, 'traditional talent identification and development models are likely to exclude many, especially late maturing, "talented" children from support programs and available resources might be invested inappropriately' (Vaeyens et al., 2008, p. 711). Other ongoing disputes on the use of talent identification to predict elite success include the stimulation of early specialisation (e.g. Wiersma, 2000), the relative age effect (e.g. Baxter-Jones & Helms, 1994), pre-mature deselection of talented children (Abbott & Collins, 2002), and early drop out (e.g. Weiss & Petlichkoff, 1989). There is evidence to suggest that in some sports, like tennis and swimming, only a minority of mature elite athletes have been identified as talented at younger ages (Kalinowski, 1985; Monsaas, 1985). Instead, the athletes progressed gradually to higher stages of involvement and development, and 'talent' was a post-hoc attribution for skilled or excellent performance (Bloom, 1985). Burgess and Naughton (2010), Green (2005), and Vaeyens et al. (2008) support this gradual athlete progression instead of a talent identification approach. Nevertheless, most countries with developed sport systems continue to invest in talent identification and view it as a sound national investment (De Bosscher et al., 2015).

Theoretical framework: the attraction, retention/transition and nurturing process

Sotiriadou et al. (2008) developed the ARTN framework which details three different, yet interrelated sport development processes. These processes are the *attraction*, *retention/transition* and *nurturing*. The framework was the result of a four-year grounded theory study of annual reports and other policy documents of 35 NSOs in Australia.

It offers an organisational perspective on ‘who is involved with sport development’, in ‘what ways’, at ‘which developmental level’, and with ‘which outcomes’.

The *attraction* process aims to increase people’s awareness of sports programmes and the benefits of sport participation, encourage them to join a sport club and play sports. Often this process also aims to nurture large numbers of young participants that have the potential to become elite performers (Sotiriadou & Shilbury, 2013). *Retention/transition* is the process whereby ‘a range of policies, including development programmes and competitions/events, are implemented to identify talented junior athletes through to the highest levels of sport’ (Sotiriadou & Shilbury, 2013, p. 146). As the definition implies, the retention/transition process is inclusive of talent identification and talent development stages and focuses particularly on helping the most talented junior athletes to obtain the skills required to achieve international success. Talent identification refers to the process of recognising tennis participants that have the potential to become elite players (Unierzyski, 2006). Then, some of these talented participants may be selected (i.e. talent selection) to participate in specific competitions or training activities (De Bosscher et al., 2015; Unierzyski, 2006). As a result talent identification and selection provide the linkages between mass participation and talent development where athletes become highly committed, train and specialise in a sport (Wylleman & Lavallee, 2004). Although the retention and transition shape the second process of the ARTN framework in Sotiriadou et al. (2008), some studies provided a separate definition of the retention process. These studies refer to retention as the process of maintaining ongoing participation after initial interest. This is achieved through (a) setting up activities with key elements of fun, fitness, healthy lifestyle and socialising (Darcy & Dowse, 2013) and (b) creating quality competitions, events or services such as coaching and development programmes to take participation level and commitment to a higher level (Sotiriadou, Wicker, & Quick, 2014). Subsequently, participants’ motivation, socialisation and commitment to sports will influence their decision to continue their participation (Green, 2005). Last, *nurturing* is defined as ‘the process whereby development programs and practices are tailored to the individual athlete, team or sport to achieve best performances on the national and international sporting stage’ (Sotiriadou & Shilbury, 2013, p. 146). During the nurturing process stakeholders coordinate their efforts to tailor their strategies with the aim to achieve success at prestigious international events and competitions, and to sustain a culture of continued success at the highest level.

The three processes of the ARTN framework are analogous to the ones identified by Green (2005) including athlete entrance (the ways in which athletes are first introduced to the sport), retention (the athlete’s choice to continue to participate) and advancement (move towards more advanced levels of training and competitions). Table 1 is an overview of the studies that have applied the ARTN framework and the ways they used it. It shows that the ARTN framework has been used to examine (a) development processes in specific sports, (b) specific development processes (e.g. focus on one of the ARTN processes), (c) specific strategies (e.g. facilities), and (c) sport for specific populations (e.g. indigenous people and people with disabilities).

Although the studies in Table 1 support the wide pertinence of the ARTN framework in examining stakeholder involvement with sport development and development pathways, the framework presents certain limitations.

Table 1. Overview of studies that have applied the ARTN framework.

Study	Thomson, Darcy, and Pearce (2010)	Liebenau (2010)	Darcy and Dowse (2013)	Sotiriadou, Wicker, and Quick (2014)	Sotiriadou, Wicker, and Hill (in press)
Study title	Ganma theory and third-sector sport-development programmes for Aboriginal and Torres Strait Islander youth: Implications for sports management	Sport development pathways for amateur golfers: The case study of Queensland	In search of a level playing field – the constraints and benefits of sport participation for people with intellectual disability	Attracting and retaining club members in times of changing societies: The case of cycling in Australia	The role of community sport venues and servicescape in attracting and retaining users
Processes	Three case studies 1: Operates outside ARTN 2: Retention, transition, nurturing process 3: Attraction	Public and private pathways from grassroots to elite	Attraction, retention	Attraction, retention	Attraction, retention
Strategies	Programmes Talent identification and development (case study 2)	Coaching Sport psychology Tournaments Facilities Physical conditioning Funding	Facilities Programmes Support for participation Staff training	Promotional activities and awareness Events, programmes and incentives	Facilities Servicescape factors Environmental factors
Stakeholders	Third sector organisations, Aboriginal and Torres Strait Islander youth, communities, NSO, clubs, volunteers	Parents and family, sponsors, government, sporting organisations	Support people/ carers, volunteers, coaches, disability organisations	Clubs, members, volunteers, state bodies, sport federations	Community sport venue stakeholders, local council, governments, sport organisations (federal, local, state), public and private schools, coaches, umpires, parents

(Continued)

Table 1. Continued.

Study	Thomson, Darcy, and Pearce (2010)	Liebenau (2010)	Darcy and Dowse (2013)	Sotiriadou, Wicker, and Quick (2014)	Sotiriadou, Wicker, and Hill (in press)
Sport	Sport in general + 'a popular Australian sport'	Golf	Not specified	Cycling	Basketball
Context	Aboriginal and Torres Strait Islander youth in Australia	Queensland	People with intellectual disability. Australia	Australia (nation), Queensland (state), clubs (local)	Queensland
Use of ARTN framework	Application of some of the ARTN concepts in across-cultural context	Helped to identify golf development pathways in Australia	Extension of the ARTN. 'The framework appears to be lacking a key element at every level – material support for inclusion, particularly for those with intellectual disability' (p. 404)	'examine and test the inherent properties of the SDP framework' (p. 6)	'Based on the ARTN model, a framework is developed that isolates community sport venues as sport development tactic'

First, most of the studies in Table 1 report results on the attraction and retention levels, leaving a gap in relation to the application of all the processes at the elite level. Second, the existing applications of the framework (Table 1) explored sport development pathways in Australia, leaving room for the ARTN framework to be tested in wider contexts. A third limitation is that the framework was developed based on the analysis of NSO documents (Shilbury, Deane, & Kellett, 2006) and therefore, lacks direct insights from stakeholders involved in the sport development processes. This study broadens the application of the ARTN framework because it (a) focusses on tennis-specific development processes from the attraction and retention to the nurturing of elite athletes, (b) has an international focus, and (c) uses data from interviews with elite tennis experts.

Methods

This study used qualitative research methods to explore (a) the pathways for the development of elite tennis players and (b) the roles of stakeholders in initiating and delivering these pathways.

The participants: international tennis experts

For the purposes of this exploratory study, semi-structured in-depth interviews were conducted with international tennis experts. The tennis experts were purposefully selected to include individuals with high levels of expertise on elite sport strategies and development pathways in tennis (Creswell & Plano Clark, 2007). The 35 experts¹ that were invited to participate included high-performance directors (HPDs), coach education managers (CEMs) and other tennis experts (who presented at the bi-annually held Worldwide Coaches Conference of the International Tennis Federation between 2003 and 2011). Experts who showed interest to participate received an explanatory statement by email to inform them about the study and their involvement. Eighteen experts agreed to participate. These represented 10 countries and included five HPDs (de-identified as HPD 1–5), three CEMs (de-identified as CEM 1–3) and 10 other specialists including former HPDs, elite coaches and science managers (de-identified as Specialist 1–10) (Table 2). In order to protect experts' anonymity random numbers (e.g. Specialist 7) were allocated.

Due to the widespread locations of the tennis experts, 16 of the interviews were conducted over Skype and two face-to-face. Ethics approval for data collection (RO1163) was obtained from the institution authorising this research. The interviews ranged in length from 30 to 70 minutes and were audio recorded. Recordings were manually transcribed and resulted in a total of 232 pages of double spaced verbatim transcripts.

Data collection

A semi-structured interview technique was used in order to allow the researchers to probe the interviewees for more detail and seek further information where uncertainty existed (Edwards & Skinner, 2009). Open-ended questions were shaped to acquire detailed data on elite tennis pathways and identify how stakeholders shape these pathways. The interview schedule included questions based on the properties (i.e. stakeholders and strategies) of the ARTN framework. Examples of open questions used

Table 2. Overview of interviewed tennis experts.

Country	Tennis experts
Australia	1 HPD, 1 CEM and 2 specialists
Belgium (Flanders)	1 HPD and 1 specialist
Belgium (Wallonia)	1 HPD
Brazil	1 HPD
Czech Republic	1 specialist
France	1 CEM
Germany	2 specialists
Great Britain	1 specialist
Spain	1 specialist
The Netherlands	1 HPD and 1 CEM
The USA	2 specialists
Total: 10 countries	5 HPDs, 3 CEMs and 10 specialists
	Total: 18 experts

during the interviews included: ‘Who is involved with tennis player development?’, ‘What is the role of these stakeholders in tennis player development?’, ‘In what ways is tennis player development achieved (i.e., what strategies or programs are used for tennis player development)?’, ‘At what developmental level is each of these stakeholders involved?’ and ‘How do they contribute to elite tennis success?’. Probing questions such as ‘Could you please explain that in more detail?’ or ‘What effect does that have on elite tennis success?’ were used to understand the phenomenon under investigation and seek more detail and clarifications (Hanton, Fletcher, & Coughlan, 2005).

The results section reports on the experts’ views of generic tennis systems and includes data about stakeholders and strategies that shape elite tennis pathways. Country specific data in the results section are used to give examples or support generic findings and do not aim to compare or discuss country specific strategies.

Data analysis

The interview transcripts were entered into the qualitative data analysis software, NVivo 10, to organise and manage the data (Sotiriadou, Brouwers, & Le, 2014). Both deductive and inductive reasoning guided the data analysis for a more complete understanding of the topic that a researcher is studying (Blackstone, 2012). The interplay between inductive and deductive analysis is common for qualitative data analysis as qualitative analysis is inevitably guided and framed by pre-existing ideas and concepts (Braun & Clarke, 2006; Gibbs & Flick, 2007). Taking the ARNT framework as a starting point, deductive reasoning was used to identify ‘who is involved with tennis development’, in ‘what ways’, at ‘which developmental level’, and with ‘which outcomes’. While deductive analysis was relatively quick and easy, Burnard, Gill, Stewart, Treasure, and Chadwick (2008) suggested that it ‘can potentially bias the whole analysis process as the coding framework has been decided in advance’ (p. 429), which can severely limit theme and theory development. Therefore, thematic analysis as an inductive approach assisted the researchers to look for patterns in the

data, working to develop a theoretical framework that could explain those patterns (Blackstone, 2012). The researchers identified codes and themes that emerged from the data and gathered examples from the transcripts to illustrate the key findings. NVivo facilitated the identification of codes because it allows the creation of nodes, which provide storage areas for all text segments related to that node (i.e. open coding) (Bazeley, 2007). When all transcripts were coded, the emerged nodes were reorganised in order to create a node structure or 'tree branch' (Hutchison, Johnston, & Breckon, 2010). During this process, the researchers identified (1) sub-nodes within the nodes where a node had more than one characteristics and (2) themes where multiple nodes could be organised into a larger theme (Hutchison et al., 2010). This process was repeated until no further themes or sub-nodes emerged (Pope, Ziebland, & Mays, 1999). Open coding and organising the nodes to create tree nodes resulted in an initial coding framework (i.e. themes, nodes and their sub-nodes or characteristics) that included all the tennis player development stakeholders and their roles, as well as all the strategies and their characteristics that facilitate elite tennis pathways. The last phase of analysis examined the relationships between nodes and sub-nodes to identify higher order categories (Hutchison et al., 2010). The identified relationships between nodes and sub-nodes resulted in four higher order categories that reflect the 'tennis specific player development processes'. These are discussed in the next section.

Two of the authors coded and analysed the data separately, followed by meetings to compare and discuss the results (Patton, 1990). If there was discrepancy regarding the coding of the data, the authors assessed the data together to arrive at mutual consensus (Smith, 2007). This process provided confirmation that the data were analysed consistent with the imposed structure of the framework and that the process could be reliably duplicated (Smith, 2007).

Results

Higher order categories revealed that stakeholders (i.e. NTAs, local clubs, coaches, private academies and third party organisations) are involved within four development processes. These processes are specific to the development of elite tennis players and include (1) attraction and retention, (2) talent identification and selection, (3) talent development, and (4) nurturing. The NTAs, coaches and clubs emerged as the stakeholders that were consistently involved throughout all four development processes. However, their roles manifest differently at each process. Figure 1 shows how the role of these stakeholders varies for each of the four processes.

The attraction and retention of tennis players

NTAs, clubs and club coaches are the key stakeholders during the attraction and retention of tennis players. Specifically, the NTAs provide programmes and other forms of support to the clubs, and the clubs deliver programmes and events, and provide facilities. The role of the coaches in the attraction and retention process is to ascertain that players have a great first and ongoing experience. The experts noted that *local clubs* are at the foundation of the attraction and retention of tennis players and implement strategies to facilitate these processes. For instance, Specialist 10 indicated: 'the local tennis clubs, that is where the actual activity happens'. HPD 1

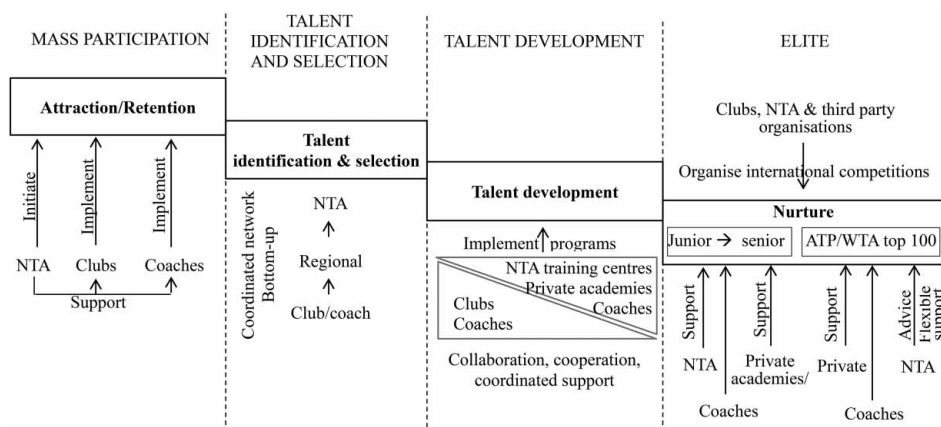


Figure 1. Stakeholder involvement and elite development pathways in tennis.

noted that the responsibility of the clubs is ‘to provide a great first and ongoing experience ... to make sure kids have a tennis experience with their peers. Clubs and coaches need to make sure kids have the same age so that they can socialise’. Clubs organise events or competitions that are adapted to mass participation level for young players and make the sport fun and enjoyable. Specialist 1 noted that these ‘competitions, leaning more towards informal competitions, can be organised by the local club or coach’.

In stressing the role of the clubs, Specialist 8 claimed that tennis facilities at mass participation level ‘are mainly provided by the local tennis clubs and sometimes by municipalities or city halls’. The clubs must ensure that there are sufficient courts that are affordable and accessible all year round. Specialist 1 illustrated the link between facility accessibility (the number of courts), availability and the development of tennis as follows: ‘If you don’t have enough of them [training facilities], or they are not accessible enough, it is very difficult to broaden the base of players and in turn, very difficult to offer enough training opportunities to help players develop’. With regard to the cost or fees of hiring tennis courts, experts repeatedly stressed that the clubs need ‘facilities with affordable prices’ (HPD 1) because ‘access to facilities is very important. Cost, it can’t be too prohibitive to play’ (Specialist 1).

The experts stressed that the *NTAs*, in cooperation with the clubs, should play a leading and supporting role in the attraction and retention process. HPD 1 summarised the NTA’s supporting role as follows: ‘the federation [NTA] helps resource clubs and they have an indirect impact on it [attraction and retention of tennis players] by providing club recourses, coaching resources and marketing for the sport’. Moreover, the NTAs develop modified tennis programmes for players aged 10 and under that the clubs deliver. Specialist 9 captured the modified characteristics of programmes with the example of a programme in his country:

Grassroots programs got to be well organised and structured and the kids have to have fun. Fun needs to be a big part of it and to that end the [NTA] has developed a [name] program. And it’s been a big initiative the [name] program to get kids all over the country starting with [the program], which is the size appropriate courts, rackets, foam balls, graduated deadness of balls, so the ball doesn’t bounce over their head all of the time when they’re little.

Some NTAs offer consultants to the local clubs to help implement and promote programmes. In support of this point, Specialist 9 commented that: 'The clubs implement the [name] program but a lot of people are employed by the [NTA] to go around the country promoting [the program] and teaching people how to apply it'. Additionally, experts suggested that some NTAs support clubs through offering them equipment or guidelines for the delivery of programmes or the organisation of activities. Specialist 5 explained: 'We [NTA] have a special package. Clubs can get the small racquets, balls, net, lines from the federation. And how you can organise a tournament, a family day in the tennis club, we have all these programs'. Other examples of NTA support that emerged included financial assistance for the construction or maintenance of tennis courts, and workshops for club coaches. HPD 1 explained how financial support of the NTA plays a role in the attraction and retention of players:

Mass participation is not as expensive as elite sport, because you rely more on the clubs and the club coaches ... But we [NTA] invest heavily in participation because we see a big opportunity to encouraging more kids to play and more coaches to promote their programs with the community.

Expert 9 summarised the interplay between the NTA and the clubs: 'The clubs are the ones that implement all the programs, but the [NTA] provides information, training, support, programming support, a lot of information that the private clubs can implement and use in their program'.

Experts expressed the view that well-educated and motivated *coaches* who are qualified to work with children are essential to the attraction and retention of tennis players. For instance, HPD 5 stated: 'you need coaches who know how to relate and how to communicate with the younger ones and get the fundamentals right, and know the different stages of development'. HPD1 referred to coaches as a 'sales force' and indicated that 'coaches need to run [a] professional and well serviced orientated business. ... The first experience of a kid or young player needs to be a very good one'. Specialist 1 confirmed that 'professionalising coaching can help mass participation because it improves the standard of coaching'.

The identification and selection of talented tennis players

During talent identification and selection, the NTA along with the clubs and coaches, are once again the most critical stakeholders. Specifically, club coaches are at the base of talent identification at the local level. NTAs organise camps for talent selection where coaches, from both the clubs and the NTA, identify talented players. A key finding in relation to talent identification and selection was that it is a *complex process*. Specialist 10 indicated: 'I think, probably it [talent identification] needs to work from the bottom-up. Talent identification is the most complicated thing in tennis. And I don't care what anybody tells you, nobody knows how to do it'. The analysis revealed the role of stakeholders, including *clubs* and the *club coaches*, and the *NTA*, on the talent identification and selection process. Specifically, 'the coaches in the clubs, as members of the NTA, they identify talent for you [NTA]' (Specialist 1) because 'the federation typically doesn't have that much reach' (Specialist 10). With regard to this, Specialist 10 indicated: 'There is still no better way of selecting talent than an expert coach's eye. So, I think the coach's expertise at the local level

needs to be tapped into as much as possible'. The NTA can steer talent identification and selection by 'organising one-day camps or selection days for all children in the region' (CEM 2). Another expert indicated that 'we [the NTA] have private coaches who are part of the talent development network ... we [the NTA] created a network of private coaches, who are certified and educated, who are out in the field and identify talent' (Specialist 2).

The experts highlighted the need for the stakeholders to coordinate talent identification and selection. For example, one expert claimed that the process is strong in his country 'because of the coordination between clubs, regional officers, and the federation. It is because of the network, weaved by the regional officers who know what clubs are working in a good way with the children' (CEM 2).

Talent development

As players move to higher levels of talent development, clubs are restricted in their capacity to offer them the required support. The NTAs become more involved as they provide collective training in their regional or national training centres with highly qualified coaches. The NTAs also play a role in providing competition opportunities as well as sport science and sport medicine support to all players during their talent development process. Experts stressed that during the talent development process 'talented players need to stay for as long as possible in their own *club*' (CEM 2) and 'they should not be taken out of their clubs until they are 14, it is good that they stay with their families' (Specialist 7). At some point, 'When they [the players] improve too much, and the club cannot support them enough, they need the possibility to go to a regional or national centre' (Specialist 8). However, CEM 2 suggested that this 'depends on the clubs, if it is a big club with many coaches, many courts and many talented players, the children can stay longer'.

NTA support and regional or national NTA training programmes are the next step in player progression from local clubs. Specialist 10 commented: 'The key is to get the good players to train with other good players as much as possible and to give that opportunity to play a lot and train together'. In order to facilitate collective training possibilities to talented players, the NTA needs *regional and/or national training centre(s)*. The role of the regional centres is to 'work with the younger kids and work as a feeder system for the national training centre' (Specialist 10) and 'create a positive, collective training environment, where the best coaches and the best young players come together to train' (Specialist 7). Some experts noted that the NTA or a regional training centre can cooperate with the clubs for the development of talented players. For example, Specialist 6 noted:

There should be cooperation in the system. It [talent development] is a cooperation between two or three coaches. They [talented players] play two or three days in the club, two days, maybe, one day in the district and maybe two days in the region. And all three coaches who take part in this must go the same way.

Another expert stated that the NTA can provide collective training moments in addition to the club training: 'We [the NTA] invite talented players between 8 and 12 years to the federation for 4-day camps, 6 times per year and give a report with working points of the players to the club coaches' (HPD 2).

The NTAs also play a role in providing competition opportunities. For example, Specialist 1 noted: ‘you [NTA] need a tournament strategy, competitions that are coordinated, so the tennis association must have a clear vision as how they want to use the tournaments, from the junior game up to professional level’. HPD 1 added to this that the NTA ‘needs a competitions’ pathway that is organised at local, regional, national and international level’.

In addition NTAs provide sport science and sport medicine support to talented players and disseminate knowledge to coaches. Specialist 9 explained: ‘we’ve got nutritionists, sports psychologists, fitness consultants like [name] who is training a lot of the best players in the world, we’ve got Dr [name] who is one of the premiere sports psychologists in the world’. Furthermore, Specialist 9 noted the importance of sharing information with coaches and other experts:

All of the great information in the world doesn’t mean anything if you can’t practically apply it in your day-to-day coaching and training. The NTA needs to disseminate that information to coaching staff, trainers and sports psychologists to build an optimum program for your players.

In addition to the publicly provided system that supports player development through NTAs, the NTA training centres, and the local clubs, some experts highlighted the importance of *private academies* on elite player development. For example, Specialist 1 explained: ‘In an ideal world you need a strong club and probably academy network and then alongside that you need the national federation [NTA] to have its own structure to allow players the flexibility to train through that system also’. Specialist 9 claimed that the success of tennis ‘is a collaborative effort between the association [NTA] and private clubs’. However, as Specialist 5 admitted: ‘We [NTA] have to cooperate with the private academies and private coaches. It’s a hard job, but we have to do it’. For example, Specialist 8 noted: ‘also if players are not in the federation [NTA] structure, the federation has to help and support them’.

Last, similar to other sport development processes, the experts stressed importance of having *coaches* ‘with the highest licence, without them it is impossible to develop talented players’ (Specialist 6). These coaches have to be willing ‘to go on the road [travel] for 20–30 weeks a year, they need to make reports, chart and videotape the matches and analyse the matches with the players’ (Specialist 7). The experts believed that offering coaches sufficient financial rewards is necessary to compensate them for the intense work they do:

Obviously, travelling with the players and being away from family and friends is a very intense role. So financial rewards for coaches, paying them to a level that rewards them for the job that they are doing, being away 25–30 weeks of the year is critical. And then setting bonuses, ranking bonuses if they are hitting certain key performance indicators or ranking targets. (Specialist 2)

The nurturing of elite players: transition to professional tennis

The results on the nurturing of elite players can be divided into two stages: (1) transitioning from junior to senior level, and (2) maintaining or improving a senior ranking. Even though NTAs’ support to players during the first stage is essential, the results show that this support is moderate during stage two when players become financially

self-sufficient. Nevertheless, the NTAs seem to continue to provide opportunities for international competitions, in cooperation with other stakeholders, to all players in the nurturing process. The experts indicated that *NTA* support during the transition from junior to senior level is critical due to the complexity of this transition. Specialist 9 indicated:

When the players make that fulltime commitment to be a professional player, that is the hardest transition of all, from junior tennis to the Pro Tour. That's when they need the most support ... there is no kind of magic formula that's going to be the same for every player, but by and large we [NTA] try to provide them with great support when they make the transition to the Pro Tour.

To achieve a successful transition from junior to senior level 'we try to extend the player support after the age of 18, because if you stop at 18, you are nowhere' (HPD 2). In fact, Specialist 2 claimed that:

the heaviest funded program is between 16 and 21, that is because that is the key transition, that is where a lot of money is spent to get kids on the road for 20–25 weeks a year and thus we invest heavily in that space.

There was little consent between the experts on whether elite tennis players should receive *NTA* support throughout their careers once their prize money is high enough for them to be financially self-sufficient. One expert felt that 'if they are pro players, they have to pay their own expenses like any other pro'. However, some other experts argued that even the best players should continue to receive *NTA* support. For example, Specialist 2 indicated: 'our pathways support athletes all the way through to Davis Cup and Fed Cup, so right now we support Player X, top 10 in the world' and Specialist 1 indicated: 'when players earn more money, inside the top 100, they may be financial self-sufficient and have more options. But that doesn't mean that the federation support, which can manifest in different ways, dries up'. Another expert stated that 'if the player is ranked in the top 50 or top 100 and making a good living, then I don't think the *NTA* should fund them, but rather provide advice' (CEM 1). The experts also indicated that elite player support needs to be flexible and provided in different ways:

The federation can give a lot of funding to the players. But the federation could also support just by providing the coach, without the players having to pay their salary and hotel. ... I think if the player is on track, the federation could help. Not all the federations are rich and they have to select some [players]. Sometimes it could be just helping them to have sponsors, because sometimes players don't have managers. A national coach could help and meet them for their tour selection, tournament selection because they have no experience and sometimes they get discouraged, they go to the wrong place. There are different levels of support. ... even if it is only an evaluation every three months by the leading coach in the national centre to give players some directions, or some private coaching, or a coach traveling, or money or so on. (Specialist 7)

The experts noted that in the nurturing process it is important that 'the federation puts on events in their own country and allow players the opportunity to compete and potentially earn money in those events. That is a huge form of support for players' (Specialist 2). Specifically, Specialist 9 indicated that 'you [*NTA*] need to provide

the entry level pro-competitive opportunities that will help your players to get a ranking started, they need a place to start'. The experts stressed that the organisation of international competitions requires the NTA to cooperate with other stakeholders such as clubs and local governments. For example, HPD 1 indicated:

The national tennis association [NTA] allows the clubs to put in a bid to host an event and the clubs work together with the association and the local government. The association [NTA] provides the marketing, collateral, officiating, the umpires, the balls, the scheduling expertise, the program, the posters, the advertising campaign. The clubs should provide the infrastructure, which includes the courts, clubhouse, cafeteria they have opened for the players, nets, parking, transportation and hotels. And then the local council should provide funding, financial funding to help the club underwrite the event.

Some experts highlighted the role of *third party organisations* that cooperate with the NTA in order to organise events. For instance, Specialist 1 explained: 'you need a professional team with experience in event management and putting on tournaments to deliver those events... and try to structure tournaments to benefit domestic players'. Similarly, HPD 4 indicated: 'international competitions can be organised by the national federation in connection or in association with organisers or sport marketing companies'.

Discussion and implications

This study applied the ARTN framework (Sotiriadou et al., 2008) in tennis to examine the roles that stakeholders play along the elite development pathway. The results showed that clubs, coaches and NTAs are involved with all the processes of athlete development. However, the findings suggest that the stakeholders' roles, influence and involvement are specific to each development process. For example, during the attraction and retention process, NTAs initiate programmes, support clubs, and offer consultants to club coaches. Then, in the talent identification process, the NTAs' role shifts towards organising talent selection days and managing talent identification processes. During talent development, the NTAs role is to provide player support at national and regional training centres, and provide opportunities for competitions as well as sport science and sport medicine support to players. Further, the NTAs provide extensive support to players in their transition from junior to senior level. When players reach a ranking where they are financially self-sufficient, the NTA support becomes more flexible to reflect player specialised needs. This change of the stakeholders' role at each development process confirms previous research claiming that the sport development strategies that stakeholders initiate and implement can be considerably different according to the development phase (Sotiriadou et al., 2008). Moreover, the findings in this study suggest that during the various sport development processes, stakeholders cooperate to obtain the best development outcomes from their strategies (Sotiriadou, 2009; Truyens et al., 2014). Last, the commercialised nature of tennis has triggered the involvement of various private sport organisations such as private academies and third party organisations in the development and support of elite players.

The theoretical contribution of this study lies in the identification of stakeholders and their roles in the initiation and implementation of support services that underpin the different processes of elite development pathways in tennis. The findings of this

study offer an organisational and managerial perspective on the roles of NTAs, clubs, coaches, private academies and third party organisations during the different sport development processes. By examining elite player pathways from an organisational perspective and identifying the stakeholders that are involved in the sport development processes, this meso-level analysis complements previous studies on talent development frameworks that have used a micro-level perspective (e.g. Bloom, 1985; Côté & Fraser-Thomas, 2007; Wylleman & Lavallee, 2004). Hence, this study extends knowledge on tennis development processes from an organisational perspective. Moreover, this study is a response to calls for sport specific studies (e.g. Greyson et al., 2010; Sotiriadou et al., 2008), as it advances knowledge specific to tennis. Last, this study extends the application of the ARTN framework (Sotiriadou et al., 2008) through (1) examining the development processes at the elite level in a specific sport, (2) applying it to an international context, and (3) using insights from stakeholders (i.e. HPDs, CEMs and other tennis specialists) that are directly involved in the elite player pathways.

Certain practical implications can also be drawn. The results show that some local clubs are highly involved in the talent identification, selection and development processes. This finding suggests that the role of clubs extends beyond offering opportunities that would achieve mass participation and socially based objectives such as community integration and the promotion of general health and wellbeing (Breuer & Haase, 2007). The heightened role of local clubs across most of the elite player development processes points towards the need to revisit the level of support clubs receive and their capacity to deliver optimal developmental pathways. For instance, the findings show that the process of talent identification and selection takes place at the club level where the coaches play a significant role in gauging talented players. Also, the findings suggest that clubs need coaches who are professional, motivated, and equipped to work with children. Therefore, NTAs can facilitate that clubs have coaches with a range of knowledge and expertise from working with children to talent identification and selection (Pankhurst, 2013). Keeping talented players at the club level for as long as possible requires well-resourced clubs that have quality facilities, qualified coaches and a pool of talented players to match their skill level during training. This finding is in line with literature found in other sports such as swimming (Greyson et al., 2010). Overall, it would appear that clubs and their coaches are pressured to professionalise their services which reflects findings from previous research on similar club- and personnel-related pressures (e.g. Sotiriadou & Wicker, 2013). Research also shows that most local clubs do not have the financial means, facilities, expertise or coaches to support athletes through the development and nurturing process (Wicker & Breuer, 2011). Therefore, it is recommended that NTAs further invest in quality, well-resourced clubs and educated club coaches. In addition, as Bayle and Robinson (2007) noted, NSOs can use quality certification systems for sport clubs and offer support such as promotional material and financial support to reward clubs in return for the investment and commitment to quality.

The experts highlighted the complexity of talent identification and the lack of clear guidelines used in the process. Consequently, the experts saw talent identification as an emerging process that relied on clubs and coaches. We can therefore conclude that talent identification is seen as a process where coaches suggest players with apparent potential rather than a process of predicting intrinsic talent. This finding is reflective of the concerns that Green (2005) and Vaeyens et al. (2008) have expressed on the

role of talent identification within the sport system. As Burgess and Naughton (2010) have suggested ‘ideally, talent identification should form part of an initial stage of a dynamic talent development model and pathway ... the identification of successful attributes should serve only as a guide, rather than inclusion criteria for elite pathways’ (p. 104). For example, the results on talent development show that player progress within the sport system as their skill level improves. This development allows them to progress from their local club, to regional or national training centres or private academies when they need more specialised facilities, coaches and support. The importance that HPDs and CEMs place on player progression and development, as opposed to talent identification, has also been stressed in past research (Brouwers et al., 2015). Consequently, the findings suggest that NTAs should direct their elite development strategies towards providing quality talent development programmes and clear transitions to higher levels. To further support these findings and promote their endorsement by decision makers, it is recommended that future research further examines how the progression of athletes to higher levels of development (e.g. from clubs to regional training centres or private academies) supports elite development.

At some point during the talent development process, talented players reach a level when clubs are not able to provide them with specialised support (see Figure 1). Then, these players might enter programmes that the NTAs coordinate at regional or national training centres. When players transition from junior to senior level (i.e. nurturing process), NTA support for coaching, travelling and accommodation during international competitions is essential. That is potentially the case due to the high annual cost to travel with a coach (i.e. varying between USD 121,000 and 197,000 for 30 tournaments) (Quinlan, 2012) and the limited prize money that these players earn (Bane & Gescheit, 2015; Flatman, 2012). Moreover, the experts highlighted the importance of extending player support after the age of 18. This is an important finding as research has showed that the ‘road to the top’ is becoming longer for tennis players. Specifically, as the average age of ATP top 100 players has increased between 1990 and 2010 from 24.4 to 26.8 years (Reid, Morgan, Churchill, & Bane, 2014), it is recommended that NTA player support is prolonged too.

The experts indicated that once players reach a level where they are financially independent (approximately top 100), the nature of NTA support changes (Figure 1). Specifically, even though these players receive less financial support, the NTAs offer them tournament advice, the provision of physiotherapists and opportunities to train with players at national training centres. This finding reflects existing research that shows that players in the top 100 (approximately) earn sufficient prize money to cover the costs of playing on the international tour (Quinlan, 2012; Reid et al., 2014; Russell, 2010). Hence, NTA support for top 100 players is less needed. Moreover, Bane and Gescheit (2015) estimated that the top 1% of the player group (i.e. men ranked in the top 50 and women ranked in the top 26) received 62% and 51%, respectively, of the entire professional prize-pool in 2014 (totalling USD 162 million for the men and USD 120 million for the women). In addition, Badenhausen (2013) found that the 10 highest-paid tennis players generated three times more from endorsements, exhibitions and appearance fees than from prize money. The high prize money and sponsorship income means that the absolute top players operate independently from their NTA (Houlihan, 2013) as they build (and pay) their own support team around them or have contracts with worldwide marketing and management companies to

assist with their talent representation, commercial marketing and endorsements (International Management Group, 2015). These high earnings of absolute elite players may explain why NTAs often aim to produce top 100 players (Brouwers et al., 2012; De Bosscher, De Knop, & Heyndels, 2003).

The findings also stress the role of *private tennis academies*, particularly during the talent development and nurturing processes. Private academies can be an alternative to players who are not selected for NTA talent development programmes. Similar results were found in a study on elite pathways for golfers (Liebenau, 2010). The tennis experts in this study stressed that talent development should be a collaborative effort between the NTA and the private academies and NTAs should also provide support to players who chose to train privately.

Last, *third party organisations* emerged as an important stakeholder in organising international tournaments. Existing research suggests that countries that want to be successful in tennis aim to host all levels of competition as this allows players to participate at international level tournaments, without having to travel overseas (Filipic, Panjan, Reid, Crespo, & Sarabon, 2013; Reid, Crespo, Atienza, & Dimmock, 2007). This study showed that both, NTAs and third party organisations play a role in the organisation of those competitions. Thereby, this study confirms the emerging role of commercial third party organisations in elite athlete development (Newland & Kellett, 2012; Philipps & Newland, 2014).

Conclusion

This study shows that a sport specific application of the ARTN framework is necessary for sport policy makers and high performance managers to draw practical implications for national, state and local sport organisations, and private sporting organisations that are involved with elite player development strategies and services. The international standing and experience of the experts that participated in this study presents strength in terms of the depth of knowledge they contributed. However, as these experts work within different sport systems, it is likely that the same terms (e.g. club, national sporting association) have different meanings or connotations to them (e.g. Henry, Amara, Al-Tauqi, & Ping Chao, 2005). Therefore, future research is required for country specific (and sport-specific) examination of the roles of stakeholders on elite athlete development.

A key stakeholder within elite athlete development that this study did not involve is the elite players themselves. Elite athletes' opinions and experiences of elite pathways may offer an additional insight to the findings offered in this study that would allow sport policy makers, sport organisations, and governing bodies to better understand the sport development needs of players. Moreover, elite players' opinions on elite player development would provide feedback about perceived barriers to elite player development.

Given the heightened role of clubs and the emergence of the private sector in developing elite tennis players, future research should include representatives from clubs, private academies and other third party organisations to further explore their interactions and investigate how they contribute to the development of talented players. It is therefore recommended that future research takes an *open systems* perspective which examines how sport organisations (e.g. NTAs) interact with private organisations in an ever-changing environment (Chelladurai, 2014). Understanding the role

of the private sector is important in commercialised sports where third party organisations (e.g. commercial tournament organisers, management companies, private academies) operate alongside the traditional and institutionalised sport development pathways (Newland & Kellett, 2012; Phillips & Newland, 2014). It is likely that the involvement of the private sector leads to variations in the ways elite sport development in commercial sports is delivered. Subsequently, we conclude that future research is required to examine emerging models of elite sport delivery in commercialised sports.

Disclosure statement

No potential conflict of interest was reported by the authors.

Note

1. The results presented in this paper are part of a larger project that included two studies. At the first study, 75 international tennis experts were invited to take part in an online questionnaire. Thirty-five experts completed the online questionnaire. In a follow-up study (reported in this paper), these 35 experts were invited to participate in a follow-up interview.

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