

1 RUNNING HEAD: Youth Sport

2

3

4 **Evidence-based policies for youth sport programs**

5

6 *Submitted to: International Journal of Sport Policy & Politics*

7

Date: October 30, 2013

8

Revised: February 11, 2014

9

Second Revision: April 15, 2014

10

11

12

13

14

15

16

17

18

19

20

21

22 Key Words: Youth, participation, performance, personal development

1 **Abstract**

2 Youth sport involvement can lead to outcomes classified as the 3Ps: performance,  
3 participation, and personal development (Côté et al. 2007a). The 3Ps are central to  
4 youth sport systems aimed at providing quality experiences to participants. A challenge  
5 for countries and national governing bodies is structuring sport to simultaneously  
6 facilitate the achievement of excellence and participation (Collins 2010), or the 3Ps. To  
7 illustrate this challenge, consider deliberate practice, which is an important activity for  
8 performance improvements, but also considered less enjoyable and less motivating  
9 compared to other sport activities, such as play (Ericsson et al. 1993). Thus, governing  
10 bodies often face the challenge of deciding which activities they intend to emphasize  
11 (e.g., early specialization directed at talent development or early diversification aimed at  
12 increasing participation), and this can have implications for the success/failure of the  
13 3Ps. The purpose of this article is to describe an inclusive sport structure for children  
14 (under age 13) targeting the development of the 3Ps, which would be an asset to sport  
15 scientists, policy makers, and practitioners. Common goals for the 3Ps include: avoid  
16 burnout/dropout, cultivate intrinsic motivation, and maximize involvement in various  
17 sport activities. Our contention is the 3Ps can co-exist under one system when that  
18 system is structured according to the age and competitive level of participants. The  
19 Developmental Model of Sport Participation (Côté and Abernethy 2012) and its 7  
20 postulates (Côté et al. 2009) will be used as the basis of this paper to provide evidence-  
21 based policies for children in sport.

1 Youth sport has the potential to promote a number of important outcomes in  
2 young people's development. From a policy perspective, authors (e.g., Skille 2011,  
3 Comeau 2013) have discussed two views of youth sport that are often perceived as being  
4 contradictory: excellence and participation. Despite the promotion of these two  
5 objectives, it appears that the elite youth sport agenda typically comes ahead of the  
6 participation objectives and that few countries are able to balance policies and resources  
7 that maximize the developmental benefits of youth sport (Collins 2010). Nevertheless,  
8 Skille (2011) highlighted the limitation of policy analysis of national sport systems and  
9 suggested a bottom up approach for research that focuses on particular sport clubs and  
10 athletes to better understand how individuals achieved various outcomes in sport. The  
11 questions surrounding "What constitutes the outcomes of youth sport?" and "How are  
12 these outcomes achieved?" are issues that coaches, parents, and policy makers struggle  
13 to define and agree upon (Coalter 2007). These fundamental questions have created  
14 several debates among researchers and policy makers in terms of how youth sport  
15 programs should be structured.

16 Siedentop (2002a), for example, suggested three primary goals for junior youth  
17 sport programs: the elite-development goal, the public health goal, and the educative  
18 goal. Similarly, Côté et al. (2007a) refer to the outcomes of youth sport as the 3 Ps:  
19 Performance, Participation, and Personal Development. Accordingly, there is evidence  
20 from research and practice that different youth sport programs are structured to meet  
21 these outcomes independently. For instance, a number of researchers view youth sport  
22 as the initial step in talent development programs that are aimed at developing the  
23 *performance* of elite level athletes (e.g., Ford et al. 2009). Such programs are

1 characterized by the long-term goal of achieving elite performance; unfortunately, this is  
2 often at the cost of short-term gratification and enjoyment (Côté and Abernethy 2012).  
3 Other researchers advocate that youth sport programs should maximize time spent in  
4 physical activity as a way to diminish issues related to lack of exercise among youth  
5 (e.g., Janssen and LeBlanc 2010). Accordingly, several youth sport programs have been  
6 developed with the goal of increasing physical activity *participation* through sport  
7 (Siedentop 2002b). Finally, numerous researchers propose that sport is an ideal activity  
8 to teach and transmit positive life values to young people (e.g., Danish et al. 1993).  
9 Several sport programs, such as Sports United to Promote Education and Recreation  
10 (SUPER; Danish et al. 2002), Play it Smart (Petitpas et al. 2004), and the First Tee  
11 (Weiss et al. 2013) are specifically designed to achieve this objective of facilitating  
12 *personal development* through sport. These examples of programs are in line with  
13 different views of youth sport as having the power to enhance physical activity  
14 participation, elite performance, and development; however, the focus of programs on  
15 one outcome over another creates difficulty for policy makers (Coalter 2010).

16         The challenging task of policy makers and administrators of youth sport  
17 programs is to develop a structure that meets the multiple needs of young participants  
18 and serves the different outcomes of youth sport. Siedentop (2002a) has suggested that  
19 the contrasting natures of the different outcomes of youth sport are not achievable within  
20 single program and should be promoted by different programs:

21         Goals for sport programs, of course, don't have to be mutually exclusive,  
22         and one is tempted to argue that all goals can be met equally through one  
23         system; but that smacks of theology rather than theory, and the evidence

1           doesn't support that particular theology (p. 394)  
2       Evidence has accumulated since this statement and one can make a defensible argument  
3       that the outcomes of performance, participation, and personal development are not  
4       necessarily incompatible. In this article, we present a global picture of sport policy in  
5       youth sport – one which focuses on developing all of the 3Ps – that is clearly supported  
6       by scientific evidence and can be implemented by regional and national sport governing  
7       bodies. We will first discuss the three general outcomes of youth sport and present  
8       research that supports the design of sport programs during childhood that positively  
9       impact the participation rate, future elite performance, and personal development of  
10      youth athletes.

11

### **Performance**

12           Early specialization programs where children are identified and selected at a young  
13      age to compete and achieve at an elite level of performance are common in several  
14      countries around the world and in various sports. For instance, competitive gymnastics  
15      programs, tennis academies, or elite soccer clubs identify children at young ages to put  
16      them through rigorous training programs with the long-term goal of developing elite  
17      athletes. The human and physical resources invested in these programs are important as  
18      youth are seen as raw potential that need to be developed. As an example, Pearson et al.  
19      (2006) reported that professional sports clubs in England continue to invest substantial  
20      resources into attempts to identify talented athletes at young ages.

21           Reviews of the talent detection and identification literature in sport, however,  
22      show that long-term prediction of talented athletes is unreliable, especially when  
23      detection of talent is attempted during the prepubertal or pubertal growth periods (e.g.,

1 Vaeyens et al. 2009). One study that particularly exemplifies the difficulty of talent  
2 detection and prediction was conducted with ice hockey players in Canada. Parcels  
3 (2002) described the chances of achieving elite status in ice hockey (i.e., playing in the  
4 National Hockey League [NHL]), noting that transition from youth ice hockey to the  
5 NHL is extremely rare. 33,000 males born in 1975 registered with the Ontario Minor  
6 Hockey Association, a youth developmental league. From this cohort, 48 (0.15%) were  
7 eventually drafted by an NHL team, though only 32 (0.09%) played one NHL game.  
8 Even more rare were players that played more than one full NHL season (15; 0.04%)  
9 and players that played over 400 games, or approximately five seasons (6; 0.01%). With  
10 such low odds for success, it is understandable that predicting elite status in youth sport  
11 is unreliable.

12 Ericsson et al. (1993) framework of deliberate practice (defined as high quality,  
13 high concentration practice that is not inherently enjoyable and done with the primary  
14 goal of improving performance) suggests a performance approach to youth sport  
15 programming. The deliberate practice framework, which has been popularized in books  
16 such as *Outliers* (Gladwell 2008) and the *Talent Code* (Coyle 2009), suggests that to  
17 reach the highest level of performance, one must engage in 10,000 hours or 10 years of  
18 deliberate practice in their chosen domain (sport). Essentially, the framework proposes  
19 that elite athletes must specialize in their main sport and start deliberate practice at a  
20 very young age.

21 While there is some sport research that supports a positive relationship between  
22 deliberate practice training and elite performance (e.g., Hodges and Starkes 1996,  
23 Starkes et al. 1996, Helsen et al. 1998, Hodge and Deakin 1998), several dimensions of

1 the theory of deliberate practice have not been supported (see Abernethy et al. 2003 for  
2 a review). For example, few studies have shown that 10,000 hours of deliberate practice  
3 is indeed a prerequisite for expert performance in sport. To the contrary, studies show  
4 that expert performance in sports where peak performance generally occurs after the age  
5 of 20 has been achieved with 3,000 to 4,000 hours of sport-specific training (i.e.,  
6 deliberate practice; Côté and Abernethy 2012). Therefore, specialized sport programs at  
7 young ages (i.e., ages 6-12) to develop elite level athletes are not necessary in most  
8 sports. Instead, providing opportunities for all children to participate in various informal  
9 and organized recreational sports should be the focus of sport programmers even if  
10 developing elite athletes (e.g., the performance objective) is the ultimate goal of the  
11 program. In other words, diversity (instead of specialization) during childhood has a  
12 positive effect on future elite performance as well as long-term participation in sport  
13 (Côté et al. 2009).

#### 14 **Participation**

15 Recreational sport programs that supposedly focus on involvement of all youth  
16 are among the most popular extra-curricular activities for children. Recently, ESPN  
17 collated a wealth of information from previous research on recreational sport  
18 participation in the United States (Kelley and Carchia 2013). This allowed ESPN to  
19 present a comprehensive examination of youth sport participation rates and influences  
20 on sport participation. The study affirmed the popularity of youth sport, noting that 25  
21 million youth (aged 6-17) participated in some form of recreational sport during the  
22 previous year. Examining these numbers further, approximately 60% of male youth and  
23 50% of female youth were registered on at least one organized sport team by age 6.

1 Although recreational youth sport programs should lead to lifelong participation in  
2 sport, the dropout rate during adolescence is alarming with an estimated one-third of all  
3 participants between 10 and 17 years of age withdrawing from sport programs every  
4 year (Gould 1987, Kelley and Carchia 2013).

5         While youth sport clearly provides opportunities for long-term participation,  
6 there appears to be a void between the potential of youth sport and some of the negative  
7 realities of youth sport programs, as evidenced by the dropout rate. One of the key  
8 issues for researchers and practitioners must be to close this void and work together to  
9 assure that youth have positive rather than negative experiences in sport, thereby  
10 reducing the dropout rate and sustaining long-term participation. The potential financial  
11 and social rewards that can result from participation in elite sport as adults, have  
12 affected youth sport programming over the last 20 years. Youth sport programs around  
13 the world are adapting a view of sport that focuses on long-term athlete development,  
14 institutionalization, elitism, early selection, and early specialization with the explicit or  
15 implicit goal of developing elite level athletes (Collins 2010, Côté et al. 2011) instead of  
16 focusing on the short-term and inherent enjoyment that result from sport participation.  
17 Today's recreational sport programs supervised by adults are requiring higher levels of  
18 investment from earlier ages (Ewing and Seefeldt 1996, Hancock et al. 2013a), and  
19 focus on certain aspects of sport participation (e.g., development of skills) that often do  
20 not coincide with children's motives to participate in sport in the first place (e.g., have  
21 fun and be with friends). In other words, these types of recreational programs often  
22 discourage children from participating in a diversity of activities that are instantly  
23 rewarding and enjoyable. However, there seems to be clear evidence suggesting that



1 sport programs such as these may not be providing optimal environments for youths’  
2 long-term participation in sport and, as importantly, hinder overall physical and  
3 psychosocial development (Côté et al. 2011).

#### 4 **Personal Development**

5 Certain sport programs are explicitly designed to teach life skills and personal  
6 development such as First Tee (Weiss et al. 2013), Teaching Personal and Social  
7 Responsibility in sport program (TPSR; Hellion and Walsh 2002), and Sports United to  
8 Promote Education and Recreation program (SUPER; Danish et al. 2002). In such  
9 programs, athletes learn about personal development assets, such as goal setting or  
10 perseverance, and are explicitly taught to transfer such assets to other life settings (e.g.,  
11 goal setting in educational environments). However, if sport is only perceived as a  
12 support for personal development in other domains, there is a risk to undermining the  
13 value of sport-specific knowledge and skills also beneficial to long-term sport  
14 participation (Turnnidge et al. in press). A sole focus of sport programs on personal  
15 development is an adult decision that does not necessarily align with children’s  
16 motivation to participate in sport.

17 Sport researchers and the wider sports community need to have a clear vision of  
18 the inherent value of sport participation and the best way to transmit positive personal  
19 values through sport. The advantage of a diversified and playful environment in sport  
20 during childhood is that it provides young athletes with a breadth of experiences that  
21 emphasize exploration before commitment to a specific sport activity. Empirical  
22 evidence (Busseri et al. 2006, Fredericks and Eccles 2006, Rose-Krasnor et al. 2006)  
23 shows that a breadth of experiences in early development is an indicator of continued

1 involvement in more intense activities later in life and of successful development of  
2 personal assets such as competence and confidence. Furthermore, youth sport programs  
3 built around the concepts of diversity and play have a protective effect against negative  
4 outcomes such as burnout, dropout, and injuries (Law et al. 2007, Wall and Côté 2007,  
5 Fraser-Thomas et al. 2008a, 2008b).

6 The experiences and opportunities that sport provides are not different from  
7 other life situations and, therefore, it is reasonable to assume that a positive environment  
8 is the best way to promote positive youth development through sport participation.

9 Accordingly, the eight setting features of the National Research Council and Institute of  
10 Medicine (NRCIM; 2002) have received increasing support from youth sport research as  
11 they offer an additional understanding of the context in which youth sport should be  
12 structured to promote personal development (Strachan et al. 2011). The eight setting  
13 features of the NRCIM are consistent with models of development in sport that favour  
14 play and inclusion (e.g., Siedentop 2002a, Griffin and Butler 2005, MacDonald et al.  
15 2009) to promote the outcomes of excellence and participation in sport.

### 16 **Integration of Performance, Participation and Personal Development**

17 Although it is relatively easy to identify the primary objective of a given youth  
18 sport program, a sole focus on one objective (e.g., performance) often reduces the  
19 importance of the other two objectives (e.g., participation and personal development) and  
20 minimizes the potential that sport involvement can have on youths' lives. There is growing  
21 evidence that youth sport programs for children can be designed to focus on all three  
22 outcomes and be successful in developing skilled performance, maintaining participation  
23 rates, and enhancing personal development. Thus, by focusing on the common building

1 blocks that all young people need, we can enhance the experience of children in sport and  
2 reduce the costs associated with the design of different youth sport programs.  
3 Understanding athlete development models is the first step in this process.

#### 4 **Athlete Development Models**

5 Over the past three decades, a number of athlete development models have been  
6 proposed. Alfermann and Stambulova (2007) highlighted and reviewed five of these  
7 research-based models (Bloom 1985, Salmela 1994, Stambulova 1994, Côté 1999,  
8 Wylleman and Lavallee 2004). More recently, Bruner et al. (2010) conducted a citation  
9 network analysis and revealed two additional models published in peer-reviewed  
10 journals (Abbott and Collins 2004, Bailey and Morley 2006). Surprisingly, the Long-  
11 Term Athlete Development model (LTAD; Balyi and Hamilton 2004) did not appear in  
12 these comprehensive reviews despite its widespread implementation in many countries.  
13 The lack of research around the LTAD reinforces its focus as a commercial product that  
14 is not supported by any significant line of evidence. In fact the LTAD was originally  
15 developed as an elite performance model based on principles of motor development and  
16 has been adjusted over the years to fit the agenda of various sport organizations and  
17 government policies. The most recent version of the LTAD contains numerous claims  
18 about athletes' development that are often conflicting and have never been tested or  
19 evaluated in specific sport contexts (Bailey et al. 2010, Ford et al. 2011, Malina 2013).

20 Citation analysis studies of athletes' developmental models (Bruner et al. 2009,  
21 Bruner et al. 2010) have found the Developmental Model of Sport Participation  
22 (DMSP; Côté 1999, Côté et al. 2007b) to be the most prominent conceptualization of  
23 athletes' development in the sport literature. The DMSP has been developed and

1 refined over the last 20 years and presents a set of concepts about athletes' development  
2 that are quantifiable and testable. The DMSP was developed in a series of four steps  
3 that must be understood before the model is applied to the 3Ps of sport outcomes.

4         The first step involved an initial conceptualization of athletes' development  
5 resulting from interviews with parents, coaches, and athletes (Côté 1999). This original  
6 model was in line with results from other qualitative studies of athletes' development (e.g.,  
7 Bloom 1985, Carlson 1988) while providing explicit and original propositions that could  
8 be quantified and tested empirically. Two new concepts regarding sport involvement  
9 throughout the lifespan emerged from this first step: 1) diversity and 2) deliberate play.  
10 The concept of diversity describes a level of involvement in different sports during  
11 childhood. Indeed, retrospective studies of elite athletes in different sports and from  
12 different backgrounds support the idea that being involved in different sports during  
13 childhood is linked to long-term participation and elite performance in sport (Berry et al.  
14 2008, Gulbin et al. 2010, Leite and Sampaio 2012, Bridge and Toms 2013). The concept  
15 of deliberate play was described by elite level athletes (Côté 1999) as sport activities they  
16 engaged in during childhood that were inherently enjoyable and differed from organized  
17 sport and adult-led practices such as deliberate practice. Activities that exemplify  
18 deliberate play include street hockey and pick-up basketball. These games use adapted  
19 rules of traditional sports (e.g., one-on-one basketball) and are loosely monitored by the  
20 children playing the sport and/or adults. Deliberate practice, on the other hand, requires  
21 effort, generates no immediate rewards, and is motivated by the goal of improving  
22 performance rather than its inherent enjoyment (Ericsson et al. 1993). The concepts of  
23 diversity and deliberate play were the main elements of the proposed DMSP, which

1 consisted of three stages of development including the 1) sampling years (ages 6-12), 2)  
2 specializing years (ages 13-15), and 3) investment years (ages 16+).

3           In a second step, a quantitative, retrospective methodology was developed over  
4 several years (Côté et al. 2005) to test the assumptions of the DMSP. More specifically,  
5 the retrospective interview was designed to account for the developmental activities of  
6 athletes throughout the three stages of the DMSP, and to test the importance of  
7 diversification versus specialization and deliberate play versus deliberate practice  
8 throughout the athletes' careers. Using this methodology, a series of studies were  
9 conducted with groups of expert and non-expert athletes (e.g., Baker et al. 2003a, Baker et  
10 al. 2003b, Soberlak and Côté 2003, Baker et al. 2005, Law et al. 2007, Berry et al. 2008)  
11 to refine the DMSP and provide clarity on its different outcomes and trajectories. All in  
12 all, these studies showed that diversity and deliberate play during childhood are important  
13 developmental activities associated with expertise (performance) and long-term sport  
14 retention (participation). Transitioning to the specialization stages in one or two sports,  
15 accompanied by higher amounts of deliberate practice, usually occurred after age 13. This  
16 was followed two to three years later by high investment and high deliberate practice in  
17 one sport. These findings are consistent across sports where peak performance is achieved  
18 after maturity such as ice hockey, baseball, rowing, and triathlon, but does not hold for  
19 sports in which peak performance is achieved during adolescence, such as gymnastics  
20 (Law et al. 2007). Following this knowledge accrument, the DMSP was adapted to  
21 reflect the different developmental trajectories. A new "early specialization" pathway was  
22 added to the DMSP to parallel the three-stage model of sampling, specializing, and  
23 investment. Additionally, a "recreational participation" stage was added to reflect the

1 choice that athletes can make after the sampling years; that is, to move into a recreational  
2 or a specialization stage of participation.

3           For the third step in the DMSP refinement, the retrospective method was adapted  
4 and used to compare the activities, experiences, and outcomes of athletes that engaged in  
5 different pathways of the DMSP (Robertson-Wilson et al. 2003, Wright and Côté 2003,  
6 Wall and Côté 2007, Fraser-Thomas et al. 2008a, Strachan et al. 2009). This holistic  
7 approach to athletes' development was further substantiated with new qualitative studies  
8 of athletes who had achieved long-term participation and exceptional performance in sport  
9 (Fraser-Thomas and Côté 2009, Strachan et al. 2011). Côté and Abernethy (2012)  
10 reviewed and discussed the results of this third wave of studies in a recent book chapter,  
11 and highlighted the benefits of diversification and deliberate play, as well as the costs  
12 associated with an early specialization trajectory in sport. The benefits of diversification  
13 and deliberate play consist mainly of protecting against sport attrition by reducing burnout,  
14 limiting overuse injuries, and increasing enjoyment, while early specialization increases  
15 burnout, increases overuse injuries, and reduces enjoyment. Furthermore, diversification  
16 and deliberate play can make unique contributions to skill development through implicit  
17 learning.

18           Finally, a fourth step involved the refinement of the DMSP by making specific  
19 links between the different pathways and the outcomes of performance, participation, and  
20 personal development. This stage involved mainly the writing of theoretical papers  
21 (Fraser-Thomas et al. 2005, Côté et al. 2007a, 2007b) and the creation of seven postulates  
22 related to the concepts of diversity and deliberate play during childhood (Côté 2009, Côté  
23 et al. 2009). Below is the updated evidence that supports the postulates of the DMSP.

1 **Postulate 1: Early diversification does not hinder elite sport participation in sports**  
2 **where peak performance is reached after maturation**

3 This postulate focuses on the association between early diversification and the  
4 performance outcome of youth sport. Evidence from several studies suggests that elite  
5 athletes who experience a diversified sport background can still reach an elite level of  
6 performance (Bloom 1985, Carlson 1988, Baker et al. 2003b, Abernethy et al. 2005) and,  
7 indeed, for some team ball sports, diversity of experience seems to be more prevalent  
8 among the more successful athletes (Baker et al. 2003b, Berry and Abernethy 2009).  
9 Further, the link between early diversification and performance has been established across  
10 contexts including different countries (e.g., Berry et al. 2008, Bridge and Toms 2013) and  
11 city sizes (Surya et al. 2012).

12 **Postulate 2: Early diversification is linked to a longer sport career and has positive**  
13 **implications for long-term sport involvement**

14 This postulate focuses on the association between diversification and the  
15 participation outcome of youth sport. The physical and psychological benefits of varied  
16 involvement in sports on long-term participation have been supported through numerous  
17 studies. Among these, evidence supports the notion that increased sport diversification  
18 increases participation (i.e., avoids dropout) in many sports including tennis (Carlson  
19 1988, Gould et al. 1996), swimming (Fraser-Thomas et al. 2008a, 2008b), and ice  
20 hockey (Wall and Côté 2007). Additionally, longitudinal data of nine active and nine  
21 inactive women over 13 years of sport participation showed that being involved in  
22 various sports during childhood led to life-long participation (Robertson-Wilson et al.  
23 2003).

1 **Postulate 3: Early diversification allows participation in a range of contexts that**  
2 **most favourably affects positive youth development**

3 This postulate focuses on the association between diversification and the  
4 personal development outcome of youth sport. The advantage of a diversified  
5 foundation in sport during the sampling years provides young athletes with a breadth of  
6 experiences without an intense focus on skill acquisition and performance in one sport.  
7 Empirical evidence (Busseri et al. 2006, Fredericks and Eccles 2006, Rose-Krasnor et al.  
8 2006) shows that a breadth of experiences in early development is an indicator of  
9 continued involvement in more intense activities later in life and of successful  
10 development. In sport, Wright and Côté (2003) showed that diversified sport  
11 experiences in childhood fostered positive peer relationships and leadership skills.

12 Wilkes and Côté (2007) reviewed the youth sport literature and suggested that  
13 children who sampled a variety of sports were also exposed to unique socialization  
14 experiences that shaped development. The following are five developmental outcomes  
15 that sampling can promote: 1) intrapersonal skills, 2) prosocial behaviour, 3) healthy  
16 identity, 4) diverse peer groups, and 5) social capital.

17 **Postulate 4: High amounts of deliberate play during the sampling years builds a**  
18 **solid foundation of intrinsic motivation through involvement in activities that are**  
19 **enjoyable and promote intrinsic regulation**

20 This postulate focuses on the association between deliberate play and the  
21 participation outcome of youth sport. Motivation theories such as self-determination  
22 theory (Deci and Ryan 1985, Ryan and Deci 2000) and achievement goal theory (Biddle  
23 2001, Treasure 2001) suggest that early intrinsically motivating activities such as



1 deliberate play will have a positive effect over time on an individual's overall  
2 motivation. This early motivation has important implications for future development  
3 and continued participation in sport. Fry (2001) notes that an individual's motivational  
4 orientation appears to be set by age 12 or 13. In order to promote lifelong, intrinsically  
5 motivated sport participation, it is imperative to build a foundation during childhood.  
6 Inclusion of high amounts of deliberate play activities early in development provides  
7 that motivational foundation. Support for this postulate has emerged from qualitative  
8 studies of athletes' careers (e.g., Bloom 1985, Carlson 1988, Côté 1999) and from  
9 quantitative studies of expert and non-expert athletes' training and experiences (e.g.,  
10 Baker et al. 2003a, 2003b, Soberlak and Côté 2003, Baker et al. 2005, Berry et al. 2008).  
11 Furthermore, studies of dropout athletes provide additional evidence that deliberate play  
12 during childhood is an important determinant of continued participation and  
13 commitment to sport (Wall and Côté 2007, Fraser-Thomas et al. 2008a, Fraser-Thomas  
14 and Côté 2009).

15 **Postulate 5: A high amount of deliberate play during the sampling years establishes**  
16 **a range of motor and cognitive experiences that children can ultimately bring to**  
17 **their principal sport of interest**

18 This postulate focuses on the association between deliberate play and the  
19 performance outcome of youth sport. Qualitative and quantitative studies have  
20 demonstrated that high amounts of deliberate play in elite tennis (Carlson 1988, Côté  
21 1999), rowing (Côté 1999), ice hockey (Soberlak and Côté 2003) and baseball (Hill  
22 1993) were associated with elite performance in adulthood. Furthermore, quantitative  
23 comparisons of elite and less elite athletes demonstrated that elite players were involved

1 in more deliberate play hours than deliberate practice hours during childhood (Berry et  
2 al. 2008, Memmert et al. 2010, Ford and Williams 2012). The development of  
3 adaptability and creativity promoted by free experimentation in a safe, low-risk  
4 environment has been posited as the mechanism accounting for the empirically recorded  
5 benefits of deliberate play activities on skill acquisition and elite performance (Côté et  
6 al. 2007b).

7 **Postulate 6: Around the end of primary school (or early years of secondary school;**  
8 **about age 13), children should have the opportunity to either choose to specialize in**  
9 **their favourite sport, or to continue in sport at a recreational level**

10 This postulate focuses on the transition between childhood and adolescence as an  
11 important period to specialize in one sport or stay involved in sport at a recreational  
12 level. Specialization in one sport typically does not occur, nor does it need to occur,  
13 before age 13 in sports where peak performance is reached in adulthood. One of the  
14 most important reasons that all children should be provided with sampling opportunities  
15 during childhood is from a motivational perspective. The quality of early learning  
16 experiences through diversification and deliberate play during childhood develop not  
17 only physical competencies, but also perceptions of competence, which in turn lead to  
18 motivation for continued participation, performance, and personal development (Bruner  
19 et al. 2011). Motivation theories suggest that children's perceptions of competence in  
20 late childhood (ages 8-12) are largely the result of comparisons with their peers. It is  
21 only at about the age of 12 or 13 that children are able to fully understand the differing  
22 effects that effort, practice, and ability have on their performances (Horn and Harris  
23 2002). Because children do not understand competition and sport performances the

1 same way adults do, coaches should not overemphasize performance through deliberate  
2 practice or over-organized competition during childhood. In fact, overemphasizing  
3 performance can lead to early stratification of youth sport competitive levels, which  
4 might perpetuate relative age effects (participation or performance advantages for  
5 athletes born early in the selection year; Musch and Grondin 2001). Hancock et al.  
6 (2013b) exemplified this trend discovering that Canadian youth ice hockey players  
7 demonstrated relative age effects at the youngest competitive levels (age 7) where early  
8 stratification begins. By introducing early stratification, deselected athletes possibly  
9 experience decreases in competence, confidence, and motivation. This is despite the  
10 fact that deselections might be attributed to relative age and are not indicative of  
11 potential sport ability. In essence, a relative younger child's motivation to engage in  
12 sport might unnecessarily be tempered by premature stratification.

13 **Postulate 7: Late adolescents (around age 16) have developed the physical,**  
14 **cognitive, social, emotional, and motor skills needed to invest their efforts into**  
15 **highly specialized training in one sport**

16 This postulate focuses on the transition to an intense period of training with the  
17 sole purpose of developing elite performance in one sport. For those few athletes with  
18 the talent, dedication, and potential to reach elite status, it is important to enter the  
19 investment stage at the developmentally appropriate time. By about age 12, children are  
20 cognitively and physically ready to participate in competitive sports; however, investing  
21 in one sport requires a few more years of maturity (Patel et al 2002). In fact, sport  
22 studies indicate that age 16 is an appropriate time to begin increasing deliberate practice  
23 hours in one sport, and limiting involvement in other sports (Helsen et al. 1998, Côté

1 1999, Baker et al. 2003a, Kirk and MacPhail 2003, MacPhail et al. 2003, Baker et al.  
2 2005). Moreover, research in sports where specialization and investment occur before  
3 age 16 (e.g., female gymnastics and figure skating) has indicated several negative  
4 outcomes such as more injuries and less enjoyment (Starkes et al. 1996, Law et al.  
5 2007).

6           The DMSP and its postulates integrate the 3Ps of sport – performance,  
7 participation, and personal development – by focusing on key proximal processes  
8 (deliberate play and diversification) and the environment in which the processes occur  
9 (role of coaches, peers, and parents). Furthermore, the overly structured, competitive, and  
10 adult-driven aspects of organized sport and deliberate practice during childhood can lead  
11 to negative outcomes such as early exclusion of late-maturing athletes and the increased  
12 prevalence of overuse injuries and dropout, all of which can potentially limit the talent  
13 development pool for certain sports. The evidence is clear that all future expert athletes  
14 need to adopt intensive, sport-specific training programs in order to be internationally  
15 competitive and successful; however, these programs should only be implemented after  
16 reaching adolescence. Despite this evidence, many organizations do not implement this  
17 approach, possibly due to lack of awareness of the benefits of a holistic, integrated  
18 approach. As such, we suggest 10 recommendations for youth sport governing bodies to  
19 consider for implementation in order to integrate the 3Ps.

### 20                           **Recommended Youth Sport Policies to Integrate the 3Ps**

21           The literature on athletes' development in sport clearly indicates that sport  
22 programs for children under the age of 13 should be aligned with the specific needs of

1 this age group. Below are 10 recommendations that should be considered in the design  
2 of sport programs for children:

- 3 1. Regulate length of season to 3 or 4 months, with a maximum of 6 months.
- 4 2. Limit lengthy travel to organized competitions.
- 5 3. Introduce “grassroots” sport programs that focus on trying different sports.
- 6 4. Do not implement a selection process of more “talented” children until the  
7 specialization years.
- 8 5. Provide healthy competitive opportunities, but do not over-emphasize winning  
9 and long-term outcomes such as championships.
- 10 6. Discourage early specialization in one sport.
- 11 7. Allow children to play all positions in a given sport.
- 12 8. Promote deliberate play within and beyond organized sport.
- 13 9. Design play and practice activities that focus on fun and short-term rewards.
- 14 10. Understand children’s needs and do not “over coach.”

### 15 **Conclusion**

16 The 3Ps of sport outcomes include performance, participation, and personal  
17 development. Frequently, governing bodies structure sport with the aim of achieving  
18 one of the 3Ps at the expense of the others. Yet it is clear from the evidence herein that  
19 sport programs can, and should, incorporate the 3Ps without sacrificing any. The keys  
20 to this balance are focusing on early diversification, deliberate play, and fun (proximal  
21 variables for the athletes) in order to develop intrinsic motivation, competitive spirit, and  
22 lifelong participation. In doing so, youth will build a foundation for elite performance  
23 (if they so choose), participation, and personal development.

1           Some of the recommendations that were generated in this article are much in line  
2 with existing sport models, such as Sport Education (e.g., Siedentop 2002b) or Teaching  
3 Games for Understanding (Griffin and Butler 2005). The recommendations, however,  
4 address larger issues not included in these pedagogical models of youth sport and  
5 suggest a fundamental redesign of sport programs and a rethinking of how coaches can  
6 best promote children’s performance, participation, and personal development in sport.  
7 The 10 evidence-based recommendations, which emerged from the DMSP and its  
8 postulates, advocate policies that focus on program designs and coaching. In terms of  
9 program designs, recommendations 1 to 5 propose changes to youth sport programs that  
10 focus on season lengths, programing of different sports, and changes in the competition  
11 structure of youth sport. Recommendations 6 to 10 are policies that concern the role of  
12 coaches. Generally, recommendations related to coaching imply knowledge and  
13 behaviours that focus on the relational aspect of coaching and de-emphasize the  
14 technical and sport-specific aspect of coaching children.

15           The 10 recommendations, derived from the DMSP and its postulates, are well  
16 supported by research and show that youth sport programs that are focused on the  
17 involvement of all children in different sport contexts and rooted in play theory can have  
18 long-term effects on the participation, future elite performance, and personal  
19 development of athletes. The application of these 10 recommendations will require the  
20 majority of adults involved in youth sport to change their traditional views and refocus  
21 their efforts on engineering a youth sport structure that focuses on the elements of sport  
22 that children value – a refocus that ought to be swift considering there is insufficient  
23 evidence supporting the position that elite sport structures facilitate mass sport

1 participation (Coalter 2004, Horne 2007). Rather, current evidence clearly demonstrates  
2 that children's sport programs targeting play and participation in different contexts tend  
3 to facilitate long-term benefits that meet the excellence and participation agenda of  
4 governments around the world (Skille 2011, Comeau 2013). Global sport organizations  
5 and sport governing bodies ought to immediately consider this integrative approach to  
6 offer their constituents more inclusive and beneficial sport opportunities.

1 **References**

- 2 Abbott, A., and Collins, D., 2004. Eliminating the dichotomy between theory and  
3 practice in talent identification and development: Considering the role of  
4 psychology. *Journal of sports sciences*, 22 (5), 395-408.
- 5 Abernethy, B., Baker, J., and Côté, J., 2005. Transfer of pattern recall skills as a  
6 contributor to the development of sport expertise. *Applied cognitive psychology*,  
7 19 (6), 705-718.
- 8 Abernethy, B., Farrow, D., and Berry, J., 2003. Constraints and issues in the  
9 development of a general theory of expert perceptual-motor performance. In: J.L.  
10 Starkes and K.A. Ericsson, eds. *Expert performance in sports: Advances in*  
11 *research on sport expertise*. Champaign, IL: Human Kinetics, 349-369.
- 12 Alfermann, D., and Stambulova, N., 2007. Career transitions and career termination. In:  
13 G. Tenenbaum and R.C. Eklund, eds. *Handbook of sport psychology*. 3rd ed.  
14 New York: Wiley, 712-736.
- 15 Bailey, R., and Morley, D., 2006. Towards a model of talent development in physical  
16 education. *Sport, education and society*, 11 (3), 211-230.
- 17 Bailey, R.P., Collins, D., Ford, P.A., MacNamara, Á., Pearce, G., and Toms, M., 2010.  
18 *Participant development in sport: An academic literature review*. Leeds: Sports  
19 Coach UK. Commissioned report for Sports Coach UK
- 20 Baker, J., Côté, J., and Abernethy, B., 2003a. Learning from the experts: Practice  
21 activities of expert decision makers in sport. *Research quarterly for exercise and*  
22 *sport*, 74 (3), 342-347.



- 1 Baker, J., Côté, J., and Abernethy, B., 2003b. Sport-specific practice and the  
2 development of expert decision-making in team ball sports. *Journal of applied*  
3 *sport psychology*, 15 (1), 12-25.
- 4 Baker, J., Côté, J., and Deakin, J., 2005. Expertise in ultraendurance triathletes early  
5 sport involvement, training structure, and the theory of deliberate practice.  
6 *Journal of applied sport psychology*, 17 (1), 64-78.
- 7 Balyi, I., and Hamilton, A., 2004. *Long-term athlete development: Trainability in*  
8 *children and adolescents. Windows of opportunity. Optimal trainability.*  
9 Victoria, BC: National Coaching Institute British Columbia and Advanced  
10 Training and Performance.
- 11 Berry, J., and Abernethy, B., 2009. Developmental influences on the acquisition of  
12 tactical decision-making expertise. *International journal of sport psychology*, 40  
13 (4), 525-545.
- 14 Berry, J., Abernethy, B., and Côté, J., 2008. The contribution of structured activity and  
15 deliberate play to the development of expert perceptual and decision-making  
16 skill. *Journal of sport & exercise psychology*, 30 (6), 685-708.
- 17 Biddle, S.J.H., 2001. Enhancing motivation in physical education. In: G.C. Roberts, ed.  
18 *Advances in motivation in sport and exercise.* Champaign, IL: Human Kinetics,  
19 101-128.
- 20 Bloom, B.S., 1985. *Developing talent in young people.* New York: Ballantine.
- 21 Bridge, M.W., and Toms, M.R., 2013. The specialising or sampling debate: A  
22 retrospective analysis of adolescent sports participation in the UK. *Journal of*  
23 *sports sciences*, 31 (1), 87-96.

- 1 Bruner, M.W., Erickson, K., McFadden, K.K., and Côté, J., 2009. Tracing the origins of  
2 athlete development models in sport: A citation path network analysis.  
3 *International review of sport and exercise psychology*, 2 (1), 23-37.
- 4 Bruner, M.W., Erickson, K., Wilson, B., and Côté, J., 2010. An appraisal of athlete  
5 development models through citation network analysis. *Psychology of sport and*  
6 *exercise*, 11 (2), 133-139.
- 7 Bruner, M.W., Strachan, L., and Côté, J., 2011. Developmental transitions in sport. In: I.  
8 Stafford, ed. *Coaching children in sport*. London: Routledge, 227-239.
- 9 Busseri, M.A., Rose-Krasnor, L., Willoughby, T., and Chalmers, H., 2006. A  
10 longitudinal examination of breadth and intensity of youth activity involvement  
11 and successful development. *Developmental psychology*, 42 (6), 1313-1326.
- 12 Carlson, R.C., 1988. The socialization of elite tennis players in Sweden: An analysis of  
13 players' backgrounds and development. *Sociology of sport journal*, 5 (3), 241-  
14 256.
- 15 Coalter, F., 2004. Stuck in the blocks? A sustainable sporting legacy. In: A. Vigor and  
16 M. Mean, eds. *After the gold rush: The London Olympics*. London: Institute of  
17 Public Policy Research/Demos, 91-108.
- 18 Coalter, F., 2007. *Sport a wider social role: Whose keeping the score?* London:  
19 Routledge.
- 20 Coalter, F., 2010. The politics of sport-for-development: Limited focus programmes  
21 and broad gauge problems. *International review for the sociology of sport*, 45  
22 (3), 295-314.
- 23

- 1 Collins, M., 2010. From 'sport for good' to 'sport for sport's sake' – not a good move  
2 for sports development in England? *International journal of sport policy and*  
3 *politics*, 2 (3), 367-379.
- 4 Comeau, G.S., 2013. The evolution of Canadian sport policy. *International journal of*  
5 *sport policy and politics*, 5 (1), 73-93.
- 6 Côté, J., 1999. The influence of the family in the development of talent in sport. *The*  
7 *sport psychologist*, 13 (4), 395-417.
- 8 Côté, J., 2009. The road to continued sport participation and excellence. In: E. Tsung-  
9 Min Hung, R. Lidor, and D. Hackfort, eds. *Psychology of sport excellence*.  
10 Morgantown, WV: Fitness Information Technology, 97-104.
- 11 Côté, J., and Abernethy, B., 2012. A developmental approach to sport expertise. In: S.  
12 Murphy, ed. *The Oxford handbook of sport and performance psychology*. New  
13 York: Oxford University Press, 435-447.
- 14 Côté, J., Baker, J., and Abernethy, B., 2007b. Practice and play in the development of  
15 sport expertise. In: G. Tenenbaum and R.C. Eklund, eds. *Handbook of sport*  
16 *psychology*. 3rd ed. New York: Wiley, 184-202.
- 17 Côté, J., Coakley, C., and Bruner, M.W., 2011. Children's talent development in sport:  
18 Effectiveness or efficiency? In: S. Dagkas and K. Armour, eds. *Inclusion and*  
19 *exclusion through youth sport*. London: Routledge, 172-185.
- 20 Côté, J., Ericsson, K.A., and Law, M.P., 2005. Tracing the development of athletes  
21 using retrospective interview methods: A proposed interview and validation  
22 procedure for reported information. *Journal of applied sport psychology*, 17 (1),  
23 1-19.

- 1 Côté, J., Lidor, R., and Hackfort, D., 2009. ISSP position stand: To sample or to  
2 specialize? Seven postulates about youth sport activities that lead to continued  
3 participation and elite performance. *International journal of sport and exercise*  
4 *psychology*, 9 (1), 7-17.
- 5 Côté, J., Strachan, L., and Fraser-Thomas, J., 2007a. Participation, personal  
6 development, and performance through youth sport. *In: N.L. Holt, ed. Positive*  
7 *youth development through sport*. London: Routledge, 34-45.
- 8 Coyle, D., 2009. *The talent code: Greatness isn't born, it's grown. And here's how*.  
9 New York: Random House.
- 10 Danish, S.J., Fazio, R.J., Nellen, V.C., and Owens, S.S., 2002. Teaching life skills  
11 through sport: Community-based programs to enhance adolescent development.  
12 *In: J.L. Van Raalte, ed. Exploring sport and exercise psychology*. 2nd ed.  
13 Washington: American Psychological Association, 269-288.
- 14 Danish, S., Petitpas, A., and Hale, B., 1993. Life development intervention for athletes:  
15 Life skills through sport. *The counselling psychologist*, 21 (3), 352-385.
- 16 Deci, E.L., and Ryan, R.M., 1985. *Intrinsic motivation and self-determination in human*  
17 *behavior*. New York: Plenum
- 18 Ericsson, K.A., Krampe, R.T., and Tesch-Römer, C., 1993. The role of deliberate  
19 practice in the acquisition of expert performance. *Psychological review*, 100 (3),  
20 363-406.
- 21  
22  
23

- 1 Ewing, M.E., and Seefeldt, V., 1996. Patterns of participation and attrition in American  
2 agency sponsored youth sports. *In: F.L. Smoll and R.E. Smith, eds. Children and*  
3 *youth in sport: A biopsychosocial perspective.* Dubuque, IA: Brown and  
4 Benchmark, 31-45.
- 5 Ford, P.R., Ward, P., Hodges, N.J., and Williams, A.M., 2009. The role of deliberate  
6 practice and play in career progression in sport: The early engagement  
7 hypothesis. *High ability studies, 20* (1), 65-75.
- 8 Ford, P.R., et al., 2011. The long-term athlete development model: Physiological  
9 evidence and application. *Journal of sports sciences, 29* (4), 389-402.
- 10 Ford, P.R., and Williams, A.M., 2012. The developmental activities engaged in by elite  
11 youth soccer players who progressed to professional status compared to those  
12 who did not. *Psychology of sport and exercise, 13* (3), 349-252.
- 13 Fraser-Thomas, J., and Côté, J., 2009. Understanding adolescents' positive and negative  
14 developmental experiences in sport. *The sport psychologist, 23* (1), 3-23.
- 15 Fraser-Thomas, J., Côté, J., and Deakin, J., 2005. Youth sport programs: An avenue to  
16 foster positive youth development. *Physical education and sport pedagogy, 10*  
17 (1), 19-40.
- 18 Fraser-Thomas, J., Côté, J., and Deakin, J., 2008a. Understanding dropout and  
19 prolonged engagement in adolescent competitive sport. *Psychology of sport and*  
20 *exercise, 9* (5), 645-662.
- 21 Fraser-Thomas, J., Côté, J., and Deakin, J., 2008b. Examining adolescent sport dropout  
22 and prolonged engagement from a developmental perspective. *Journal of applied*  
23 *sport psychology, 20* (3), 318-333.

- 1 Fredricks, J.A., and Eccles, J.S., 2006. Extracurricular involvement and adolescent  
2 adjustment: Impact of duration, number of activities, and breadth of  
3 participation. *Applied developmental science*, 10 (3), 132-146.
- 4 Fry, M.D., 2001. The development of motivation in children. In: G.C. Roberts, ed.  
5 *Advances in motivation in sport and exercise*. Champaign, IL: Human Kinetics,  
6 51-78.
- 7 Gladwell, M., 2008. *Outliers: The story of success*. New York: Little, Brown and  
8 Company.
- 9 Gould, D., 1987. Understanding attrition in children's sport. In: D. Gould and M.R.  
10 Weiss, eds. *Advances in pediatric sport sciences*. Volume 2: Behavioral issues.  
11 Champaign, IL: Human Kinetics, 401-411.
- 12 Gould, D., Udry, E., Tuffey, S., and Loehr, J., 1996. Burnout in competitive junior  
13 tennis players: I. A quantitative psychological assessment. *The sport*  
14 *psychologist*, 10 (4), 322-340.
- 15 Griffin, L.L., and Butler, J.I., 2005. *Teaching games for understanding: Theory,*  
16 *research, and practice*. Champaign, IL: Human Kinetics.
- 17 Gulbin, J.P., Oldenziel, K.E., Weissensteiner, J.R., and Gagné, F., 2010. A look through  
18 the rear view mirror: Developmental experiences and insights of high  
19 performance athletes. *Talent development & excellence*, 2 (2), 149-164.
- 20 Hancock, D.J., Adler, A.L., and Côté, J., 2013a. A proposed theoretical model to  
21 explain relative age effects in sport. *European journal of sport science*, 13 (6),  
22 630-637.
- 23

- 1 Hancock, D.J., Ste-Marie, D.M., and Young, B.W., 2013b. The relative age effect in  
2 male youth ice hockey: An inference regarding coach and parental influences.  
3 *Research quarterly for exercise and sport*, 84 (1), 126-130.
- 4 Hellion, D., and Walsh, D., 2002. Responsibility-based youth programs evaluation:  
5 Investigating the investigations. *Quest*, 54 (4), 292-307.
- 6 Helsen, W.F., Starkes, J.L., and Hodges, N.J., 1998. Team sports and the theory of  
7 deliberate practice. *Journal of sport & exercise psychology*, 20 (1), 12-34.
- 8 Hill, G.M., 1993. Youth participation of professional baseball players. *Sociology of*  
9 *sport journal*, 10 (1), 107-114.
- 10 Hodge, T., and Deakin, J., 1998. Deliberate practice and expertise in the martial arts: The  
11 role of context in motor recall. *Journal of sport & exercise psychology*, 20 (3), 260-  
12 279.
- 13 Hodges, N.J., and Starkes, J.L., 1996. Wrestling with the nature of expertise: A sport  
14 specific test of Ericsson, Krampe and Tesch-Römer's (1993) theory of deliberate  
15 practice. *International journal of sport psychology*, 27 (4), 400-424.
- 16 Horn, T.S. and Harris, A., 2002. Perceived competence in young athletes: Research  
17 findings and recommendations for coaches and parents. In: F.L. Smoll and R.E.  
18 Smith, eds. *Children and youth in sport. A biopsychosocial perspective*. 2nd ed.  
19 Dubuque, IA: Kendall Hunt, 435-464.
- 20 Horne, J., 2007. The 'four knows' of sports mega-events. *Leisure studies*, 26 (1), 81-  
21 96.
- 22
- 23

- 1 Janssen, I., and LeBlanc, A.G., 2010. Systematic review of the health benefits of  
2 physical activity and fitness in school-aged children and youth. *International*  
3 *journal of behavioral nutrition and physical activity*, 7, doi: 10.1186/1479-5868-  
4 7-40.
- 5 Kelley, B., and Carchia, C., 2013. “Hey, data data – swing!” *The hidden demographics*  
6 *of youth sports*. Available from [http://espn.go.com/espn/story/\\_/id/](http://espn.go.com/espn/story/_/id/9469252/hidden-demographics-youth-sports-espn-magazine)  
7 9469252/hidden-demographics-youth-sports-espn-magazine [Accessed 10  
8 October 2013].
- 9 Kirk, D., and Macphail, A., 2003. Social positioning and the construction of a youth  
10 sports club. *International review for the sociology of sport*, 38 (1), 23-44.
- 11 Law, M.P., Côté, J., and Ericsson, K.A., 2007. Characteristics of expert development  
12 in rhythmic gymnastics: A retrospective study. *International journal of sport and*  
13 *exercise psychology*, 5 (1), 82-103.
- 14 Leite, N., and Sampaio, J., 2012. Early sport involvement in young Portuguese  
15 basketball players. *Perceptual and Motor Skills*, 111 (3), 669-680.
- 16 MacDonald, D.J., Cheung, M., Côté, J., and Abernethy, B., 2009. Place but not date of  
17 birth influences the development and emergence of athletic talent in American  
18 football. *Journal of applied sport psychology*, 21 (1), 80-90.
- 19 Macphail, A., Gorely, T., and Kirk, D., 2003. Young people’s socialisation into sport: A  
20 case study of an athletic club. *Sport, education and society*, 8 (2), 251-268.
- 21 Malina, R.M., 2013. Motor development and performance. In: J. Côté and R. Lidor, eds.  
22 *Conditions of children’s talent development in sport*. Morgantown, WV: Fitness  
23 Information Technology, 61-84.



- 1 Memmert, D., Baker, J., and Bertsch, C., 2010. Play and practice in the development of  
2 sport-specific creativity in team ball sports. *High ability studies*, 21 (1), 3-18.
- 3 Musch, J., and Grondin, S., 2001. Unequal competition as an impediment to personal  
4 development: A review of the relative age effect in sport. *Developmental review*,  
5 21 (2), 147-167.
- 6 National Research Council and Institute of Medicine., 2002. *Community programs to*  
7 *promote community development*. Washington, DC: National Academy Press.
- 8 Parcels, J., 2002. Chances of making it in pro hockey. *Ontario Minor Hockey*  
9 *Association*. Available from [http://www.omha.net/flash.asp?page\\_id=242](http://www.omha.net/flash.asp?page_id=242)  
10 [Accessed 7 January 2013].
- 11 Patel, D.R., Pratt, H.D., and Greydanus, D.E., 2002. Pediatric neurodevelopment and  
12 sports participation: When are children ready to play sports? *Pediatric clinics of*  
13 *North America*, 49 (6), 505-531.
- 14 Pearson, D., Naughton, G., and Torode, M., 2006. Predictability of physiological testing  
15 and the role of maturation in talent identification for adolescent team sports.  
16 *Journal of science and medicine in sport*, 9 (4), 277-287.
- 17 Petitpas, A.J., Van Raalte, J.L., Cornelius, A., and Presbrey, J., 2004. A life skills  
18 development program for high school student-athletes. *The journal of primary*  
19 *prevention*, 24 (3), 325-334.
- 20 Robertson-Wilson, J., Baker, J., Derbinshyre, E., and Côté, J., 2003. Childhood sport  
21 involvement in active and inactive adult females. *AVANTE*, 9 (1), 1-8.

- 1 Rose-Krasnor, L., Busseri, M., Willoughby, T., and Chalmers, H., 2006. Breadth and  
2 intensity of youth activity involvement as contexts for positive development.  
3 *Journal of youth and adolescence*, 35 (3), 365-379.
- 4 Ryan, R.M., and Deci, E.L., 2000. Self-determination theory and the facilitation of  
5 intrinsic motivation, social development, and well being. *American psychologist*,  
6 55 (1), 68-78.
- 7 Salmela, J.H., 1994. Phases and transitions across sports career. In: D. Hackfort, ed.  
8 *Psycho-social issues and interventions in elite sport*. Frankfurt: Lang, 11-28.
- 9 Siedentop, D., 2002a. Junior sport and the evolution of sport cultures. *Journal of*  
10 *teaching in physical education*, 21 (4), 392-401.
- 11 Siedentop, D., 2002b. Sport education: A retrospective. *Journal of teaching in physical*  
12 *education*, 21 (4), 409-418.
- 13 Skille, E.Å., 2011. Sport for all in Scandinavia: Sport policy and participation in  
14 Norway, Sweden and Denmark. *International journal of sport policy and*  
15 *politics*, 3 (3), 327-339.
- 16 Soberlak, P., and Côté, J., 2003. The developmental activities of elite ice hockey  
17 players. *Journal of applied sport psychology*, 15 (1), 41-49.
- 18 Stambulova, N., 1994. Developmental sports career investigations in Russia: A post-  
19 perestroika analysis. *The sport psychologist*, 8 (2), 221-237.
- 20 Starkes, J.L., Deakin, J., Allard, F., Hodges, N.J., and Hayes, A., 1996. Deliberate  
21 practice in sports: What is it anyway? In: K.A. Ericsson, ed. *The road to*  
22 *excellence: The acquisition of expert performance in the arts and sciences,*  
23 *sports, and games*. Mahwah, NJ: Erlbaum, 81-106.

- 1 Strachan, L., Côté, J., and Deakin, J., 2009. “Specializers” versus “samplers” in youth  
2 sport: Comparing experiences and outcomes. *The sport psychologist*, 23 (1), 77-  
3 92.
- 4 Strachan, L., Côté, J., and Deakin, J., 2011. A new view: Exploring positive youth  
5 development in elite sport contexts. *Qualitative research in sport, exercise, and*  
6 *health*, 3 (1), 9-32.
- 7 Surya, M., Bruner, M.W., MacDonald, D.J., and Côté, J., 2012. A comparison of  
8 developmental activities of elite athletes born in large and small cities. *Physical*  
9 *and health education academic journal*, 4 (1), 1-8.
- 10 Treasure, D.C., 2001. Enhancing young people’s motivation in youth sport: An  
11 achievement goal approach. In: G.C. Roberts, ed. *Advances in motivation in*  
12 *sport and exercise*. Champaign, IL: Human Kinetics, 79-100.
- 13 Turnnidge, J., Hancock, D.J., and Côté, J. in press. Positive youth development from  
14 sport to life: Explicit or implicit transfers? *Quest*.
- 15 Vaeyens, R., Gullich, A., Warr, C.R., and Philippaerts, R., 2009. Talent identification  
16 and promotion programmes of Olympic athletes. *Journal of sports sciences*, 27  
17 (13), 1367-1380.
- 18 Wall, M., and Côté, J., 2007. Developmental activities that lead to drop out and  
19 investment in sport. *Physical education and sport pedagogy*, 12 (1), 77-87.
- 20 Weiss, M.R., Stuntz, C.P., Bhalla, J.A., Bolter, N.D., and Price, M.S., 2013. ‘More than  
21 a game’: Impact of the First Tee life skills programme on positive youth  
22 development: Project introduction and year 1 findings. *Qualitative research in*  
23 *sport, exercise, and health*, 5 (2), 214-244.

- 1 Wilkes, S., and Côté, J., 2007. A sampling environment to promote diverse  
2 relationships and continued involvement in sport. Paper presented at the  
3 *European federation of sport psychology*, September 2007 Halkidiki, Greece.
- 4 Wright, A.D., and Côté, J., 2003. A retrospective analysis of leadership development  
5 through sport. *The sport psychologist*, 17 (3), 268-291.
- 6 Wylleman, P., and Lavallee, D., 2004. A developmental perspective on transitions faced  
7 by athletes. In: M.R. Weiss, ed. *Developmental sport and exercise psychology: A*  
8 *lifespan perspective*. Morgantown, WV: Fitness Information Technology, 507-  
9 527.