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# Evidence-based policies for youth sport programmes

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Youth sport involvement can lead to outcomes classified as the 3Ps: performance, participation and personal development. The 3Ps are central to youth sport systems aimed at providing quality experiences to participants. A challenge for countries and national governing bodies is structuring sport to simultaneously facilitate the achievement of excellence and participation or the 3Ps. To illustrate this challenge, consider deliberate practice, which is an important activity for performance improvements, but also considered less enjoyable and less motivating compared to other sport activities, such as play. Thus, governing bodies often face the challenge of deciding which activities they intend to emphasize (e.g., early specialization directed at talent development or early diversification aimed at increasing participation), and this can have implications for the success/failure of the 3Ps. The purpose of this article is to describe an inclusive sport structure for children (under age 13) targeting the development of the 3Ps, which would be an asset to sport scientists, policymakers and practitioners. Common goals for the 3Ps include the following: avoid burnout/dropout, cultivate intrinsic motivation and maximize involvement in various sport activities. Our contention is the 3Ps can coexist under one system when that system is structured according to the age and competitive level of participants. The Developmental Model of Sport Participation and its seven postulates will be used as the basis of this article to provide evidence-based policies for children in sport.

**Keywords:** youth; participation; performance; personal development



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

Siedentop (2002a), for example, suggested three primary goals for junior youth sport programmes: the elite-development goal, the public health goal and the educative goal.

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Similarly, Côté *et al.* (2007b) referred to the outcomes of youth sport as the 3Ps: performance, participation and personal development. Accordingly, there is evidence from research and practice that different youth sport programmes are structured to meet these outcomes independently. For instance, a number of researchers view youth sport as the initial step in talent development programmes that are aimed at developing the *performance* of elite-level athletes (e.g., Ford *et al.* 2009). Such programmes are characterized by the long-term goal of achieving elite performance; unfortunately, this is often at the cost of short-term gratification and enjoyment (Côté and Abernethy 2012). Other researchers advocate that youth sport programmes should maximize time spent in physical activity as a way to diminish issues related to lack of exercise among youth (e.g., Janssen and LeBlanc 2010). Accordingly, several youth sport programmes have been developed with the goal of increasing physical activity *participation* through sport (Siedentop 2002b). Finally, numerous researchers propose that sport is an ideal activity to teach and transmit positive life values to young people (e.g., Danish *et al.* 1993). Several sport programmes, such as Sports United to Promote Education and Recreation (SUPER; Danish *et al.* 2002), Play it Smart (Petitpas *et al.* 2004) and the First Tee (Weiss *et al.* 2013), are specifically designed to achieve this objective of facilitating *personal development* through sport. These examples of programmes are in line with different views of youth sport as having the power to enhance physical activity participation, elite performance and development; however, the focus of programmes on one outcome over another creates difficulty for policymakers (Coalter 2010).

The challenging task of policymakers and administrators of youth sport programmes is to develop a structure that meets the multiple needs of young participants and serves the different outcomes of youth sport. Siedentop (2002a) has suggested that the contrasting natures of the different outcomes of youth sport are not achievable within single programme and should be promoted by different programmes:

> Goals for sport programs, of course, don't have to be mutually exclusive, and one is tempted to argue that all goals can be met equally through one system; but that smacks of theology rather than theory, and the evidence doesn't support that particular theology. (p. 394)

Evidence has accumulated since this statement and one can make a defensible argument that the outcomes of performance, participation and personal development are not necessarily incompatible. In this article, we present a global picture of sport policy in youth sport – one that focuses on developing all of the 3Ps – that is clearly supported by scientific evidence and can be implemented by regional and national sport governing bodies. We will first discuss the three general outcomes of youth sport and present research that supports the design of sport programmes during childhood that positively impact the participation rate, future elite performance and personal development of youth athletes.

## Performance

Early specialization programmes where children are identified and selected at a young age to compete and achieve at an elite level of performance are common in several countries around the world and in various sports. For instance, competitive gymnastics programmes, tennis academies or elite soccer clubs identify children at young ages to put them through rigorous training programmes with the long-term goal of developing elite athletes. The human and physical resources invested in these programmes are important as

youth are seen as raw potential that need to be developed. As an example, Pearson *et al.* (2006) reported that professional sports clubs in England continue to invest substantial resources in attempts to identify talented athletes at young ages.

Reviews of the talent detection and identification literature in sport, however, show that long-term prediction of talented athletes is unreliable, especially when detection of talent is attempted during the prepubertal or pubertal growth periods (e.g., Vaeyens *et al.* 2009). One study that particularly exemplifies the difficulty of talent detection and prediction was conducted with ice hockey players in Canada. Parcels (2002) described the chances of achieving elite status in ice hockey (i.e., playing in the National Hockey League [NHL]), noting that transition from youth ice hockey to the NHL is extremely rare. A total of 33,000 males born in 1975 registered with the Ontario Minor Hockey Association, a youth developmental league. From this cohort, 48 (0.15%) were eventually drafted by an NHL team, though only 32 (0.09%) played 1 NHL game. Even more rare were players that played more than 1 full NHL season (15; 0.04%) and players that played over 400 games or approximately 5 seasons (6; 0.01%). With such low odds for success, it is understandable that predicting elite status in youth sport is unreliable.

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

While there is some sport research that supports a positive relationship between deliberate practice training and elite performance (e.g., Hodges and Starkes 1996, Starkes *et al.* 1996, Helsen *et al.* 1998, Hodge and Deakin 1998), several dimensions of the theory of deliberate practice have not been supported (see Abernethy *et al.* 2003 for a review). For example, few studies have shown that 10,000 hours of deliberate practice is indeed a prerequisite for expert performance in sport. To the contrary, studies show that expert performance in sports where peak performance generally occurs after the age of 20 has been achieved with 3000–4000 hours of sport-specific training (i.e., deliberate practice; Côté and Abernethy 2012). Therefore, specialized sport programmes at young ages (i.e., ages 6–12) to develop elite-level athletes are not necessary in most sports. Instead, providing opportunities for all children to participate in various informal and organized recreational sports should be the focus of sport programmers even if developing elite athletes (e.g., the performance objective) is the ultimate goal of the programme. In other words, diversity (instead of specialization) during childhood has a positive effect on future elite performance as well as long-term participation in sport (Côté *et al.* 2009b).

## Participation

Recreational sport programmes that supposedly focus on involvement of all youth are among the most popular extra-curricular activities for children. Recently, ESPN collated a wealth of information from previous research on recreational sport participation in the United States (Kelley and Carchia 2013). This allowed ESPN to present a comprehensive examination of youth sport participation rates and influences on sport participation. The study affirmed the popularity of youth sport, noting that 25 million youth (aged 6–17) participated in some form of recreational sport during the previous year. Examining these

numbers further, approximately 60% of male youth and 50% of female youth were registered on at least one organized sport team by age 6. Although recreational youth sport programmes should lead to lifelong participation in sport, the dropout rate during adolescence is alarming with an estimated one-third of all participants between 10 and 17 years of age withdrawing from sport programmes every year (Gould 1987, Kelley and Carchia 2013).

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

## Personal development

Certain sport programmes are explicitly designed to teach life skills and personal development such as First Tee (Weiss *et al.* 2013), Teaching Personal and Social Responsibility in sport programme (Hellion and Walsh 2002) and SUPER programme (Danish *et al.* 2002). In such programmes, athletes learn about personal development assets, such as goal setting or perseverance, and are explicitly taught to transfer such assets to other life settings (e.g., goal setting in educational environments). However, if sport is only perceived as a support for personal development in other domains, there is a risk to undermining the value of sport-specific knowledge and skills also beneficial to long-term sport participation (Turnnidge *et al.* 2014). A sole focus of sport programmes on personal development is an adult decision that does not necessarily align with children's motivation to participate in sport.

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

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

The experiences and opportunities that sport provides are not different from other life situations, and, therefore, it is reasonable to assume that a positive environment is the best way to promote positive youth development through sport participation. Accordingly, the eight setting features of the National Research Council and Institute of Medicine (2002; NRCIM) have received increasing support from youth sport research as they offer an additional understanding of the context in which youth sport should be structured to promote personal development (Strachan *et al.* 2011). The eight setting features of the NRCIM are consistent with models of development in sport that favour play and inclusion (e.g., Siedentop 2002a, Griffin and Butler 2005, MacDonald *et al.* 2009) to promote the outcomes of excellence and participation in sport.

## Integration of performance, participation and personal development

Although it is relatively easy to identify the primary objective of a given youth sport programme, a sole focus on one objective (e.g., performance) often reduces the importance of the other two objectives (e.g., participation and personal development) and minimizes the potential that sport involvement can have on youths' lives. There is growing evidence that youth sport programmes for children can be designed to focus on all three outcomes and be successful in developing skilled performance, maintaining participation rates and enhancing personal development. Thus, by focusing on the common building blocks that all young people need, we can enhance the experience of children in sport and reduce the costs associated with the design of different youth sport programmes. Understanding athlete development models is the first step in this process.

### *Athlete development models*

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

Citation analysis studies of athletes' developmental models (Bruner *et al.* 2009, 2010) have found the Developmental Model of Sport Participation (DMSP; Côté 1999, Côté

*et al.* 2007a) to be the most prominent conceptualization of athletes' development in the sport literature. The DMSP has been developed and refined over the past 15 years and presents a set of concepts about athletes' development that are quantifiable and testable. The DMSP was developed in a series of four steps that must be understood before the model is applied to the 3Ps of sport outcomes.

The first step involved an initial conceptualization of athletes' development resulting from interviews with parents, coaches and athletes (Côté 1999). This original model was in line with results from other qualitative studies of athletes' development (e.g., Bloom 1985, Carlson 1988) while providing explicit and original propositions that could be quantified and tested empirically. Two new concepts regarding sport involvement throughout the lifespan emerged from this first step: (1) diversity and (2) deliberate play. The concept of diversity describes a level of involvement in different sports during childhood. Indeed, retrospective studies of elite athletes in different sports and from different backgrounds support the idea that being involved in different sports during childhood is linked to long-term participation and elite performance in sport (Berry *et al.* 2008, Gulbin *et al.* 2010, Leite and Sampaio 2010, Bridge and Toms 2013). The concept of deliberate play was described by elite-level athletes (Côté 1999) as sport activities they engaged in during childhood that were inherently enjoyable and differed from organized sport and adult-led practices such as deliberate practice. Activities that exemplify deliberate play include street hockey and pick-up basketball. These games use adapted rules of traditional sports (e.g., one-on-one basketball) and are loosely monitored by the children playing the sport or by adults. Deliberate practice, on the other hand, requires effort, generates no immediate rewards and is motivated by the goal of improving performance rather than its inherent enjoyment (Ericsson *et al.* 1993). The concepts of diversity and deliberate play were the main elements of the proposed DMSP, which consisted of three stages of development including the (1) sampling years (ages 6–12), (2) specializing years (ages 13–15) and (3) investment years (ages 16+).

In a second step, a quantitative, retrospective methodology was developed over several years (Côté *et al.* 2005) to test the assumptions of the DMSP. More specifically, the retrospective interview was designed to account for the developmental activities of athletes throughout the three stages of the DMSP and to test the importance of diversification versus specialization and deliberate play versus deliberate practice throughout the athletes' careers. Using this methodology, a series of studies were conducted with groups of expert and non-expert athletes (e.g., Baker *et al.* 2003a, 2003b, 2005, Soberlak and Côté 2003, Law *et al.* 2007, Berry *et al.* 2008) to refine the DMSP and provide clarity on its different outcomes and trajectories. All in all, these studies showed that diversity and deliberate play during childhood are important developmental activities associated with expertise (performance) and long-term sport retention (participation). Transitioning to the specialization stages in one or two sports, accompanied by higher amounts of deliberate practice, usually occurred at approximately age 13. This was followed 2–3 three years later by high investment and high deliberate practice in one sport. These findings are consistent across sports where peak performance is achieved after maturity, such as ice hockey, baseball, rowing and triathlon, but do not hold for sports in which peak performance is achieved during adolescence, such as gymnastics (Law *et al.* 2007). Following this knowledge accruement, the DMSP was adapted to reflect the different developmental trajectories. A new 'early specialization' pathway was added to the DMSP to parallel the three-stage model of sampling, specializing and investment. Additionally, a 'recreational participation' stage was added to reflect the choice that athletes can make after the sampling years, that is, to move into a recreational or a specialization stage of participation.

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

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

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

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

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

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

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

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

Côté *et al.* (2009a) reviewed the youth sport literature and suggested that children who sampled a variety of sports were also exposed to unique socialization experiences that shaped development. The following are five developmental outcomes that sampling can promote (1) intrapersonal skills, (2) prosocial behaviour, (3) healthy identity, (4) diverse peer groups and (5) social capital.

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

This postulate focuses on the association between deliberate play and the participation outcome of youth sport. Motivation theories such as self-determination theory (Deci and Ryan 1985, Ryan and Deci 2000) and achievement goal theory (Biddle 2001, Treasure 2001) suggest that early intrinsically motivating activities such as deliberate play will have a positive effect over time on an individual's overall motivation. This early motivation has important implications for future development and continued participation in sport. Fry (2001) notes that an individual's motivational orientation appears to be set by age 12 or 13. To promote lifelong, intrinsically motivated sport participation, it is imperative to build a foundation during childhood. Inclusion of high amounts of deliberate play activities early in development provides that motivational foundation. Support for this postulate has emerged from qualitative studies of athletes' careers (e.g., Bloom 1985, Carlson 1988, Côté 1999) and from quantitative studies of expert and non-expert athletes' training and experiences (e.g., Baker *et al.* 2003a, 2003b, 2005, Soberlak and Côté 2003, Berry *et al.* 2008). Furthermore, studies of dropout athletes provide additional evidence that deliberate play during childhood is an important determinant of continued participation and commitment to sport (Wall and Côté 2007, Fraser-Thomas *et al.* 2008a, Fraser-Thomas and Côté 2009).

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

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

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

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

This postulate focuses on the transition between childhood and adolescence as an important period to specialize in one sport or stay involved in sport at a recreational level. Specialization in one sport typically does not occur, nor does it need to occur, before age 13 in sports where peak performance is reached in adulthood. One of the most important reasons that all children should be provided with sampling opportunities during childhood is from a motivational perspective. The quality of early learning experiences through diversification and deliberate play during childhood develop not only physical competencies but also perceptions of competence, which in turn lead to motivation for continued participation, performance and personal development (Bruner *et al.* 2011). Motivation theories suggest that children's perceptions of competence in late childhood (ages 8–12) are largely the result of comparisons with their peers. It is only at about the age of 12 or 13 that children are able to fully understand the differing effects that effort, practice and ability have on their performances (Horn and Harris 2002). Because children do not understand competition and sport performances the same way adults do, coaches should not overemphasize performance through deliberate practice or over-organized competition during childhood. In fact, overemphasizing performance can lead to early stratification of youth sport competitive levels, which might perpetuate relative age effects (participation or performance advantages for athletes born early in the selection year; Musch and Grondin 2001). Hancock *et al.* (2013b) exemplified this trend discovering that Canadian youth ice hockey players demonstrated relative age effects at the youngest competitive levels (age 7) where early stratification begins. By introducing early stratification, deselected athletes possibly experience decreases in competence, confidence and motivation. This is despite the fact that deselections might be attributed to relative age and are not indicative of potential sport ability. In essence, a relative younger child's motivation to engage in sport might unnecessarily be tempered by premature stratification.

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

This postulate focuses on the transition to an intense period of training with the sole purpose of developing elite performance in one sport. For those few athletes with the talent, dedication and potential to reach elite status, it is important to enter the investment stage at the developmentally appropriate time. By about age 12, children are cognitively and physically ready to participate in competitive sports; however, investing in one sport requires a few more years of maturity (Patel *et al.* 2002). In fact, sport studies indicate that age 16 is an appropriate time to begin increasing deliberate practice hours in one sport and limiting involvement in other sports (Helsen *et al.* 1998, Côté 1999, Kirk and Macphail

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

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



## Recommended youth sport policies to integrate the 3Ps

The literature on athletes' development in sport clearly indicates that sport programmes for children under the age of 13 should be aligned with the specific needs of this age group. Below are 10 recommendations that should be considered in the design of sport programmes for children:

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

## Conclusion

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

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

The 10 recommendations, derived from the DMSP and its postulates, are well supported by research and show that youth sport programmes that are focused on the involvement of all children in different sport contexts and rooted in play theory can have long-term effects on the participation, future elite performance and personal development of athletes. The application of these 10 recommendations will require the majority of adults involved in youth sport to change their traditional views and refocus their efforts on engineering a youth sport structure that focuses on the elements of sport that children value – a refocus that ought to be swift considering there is insufficient evidence supporting the position that elite sport structures facilitate mass sport participation (Coalter 2004, Horne 2007). Rather, current evidence clearly demonstrates that children's sport programmes targeting play and participation in different contexts tend to facilitate long-term benefits that meet the excellence and participation agenda of governments around the world (Skille 2011, Comeau 2013). Global sport organizations and sport governing bodies ought to immediately consider this integrative approach to offer their constituents more inclusive and beneficial sport opportunities.



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