IJSEP, 2009, 9, 07-17

ISSP Position Stand: To Sample or to Specialize? Seven Postulates about Youth Sport Activities that Lead to Continued Participation and Elite Performance

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Abstract

A comprehensive approach to sport expertise should consider the entire situation that is comprised of the person, the task, the environment, and the complex interplay of these components (Hackfort, 1986). Accordingly, the Developmental Model of Sport Participation (Côté, Baker, & Abernethy, 2007; Côté & Fraser-Thomas, 2007) provides a comprehensive framework for sport expertise that outlines different pathways of involvement in sport. In pathways one and two, early sampling serves as the foundation for both elite and recreational sport participation. Early sampling is based on two main elements of childhood sport participation: 1) involvement in various sports and 2) participation in deliberate play. In contrast, pathway three shows the course to elite performance through early specialization in one sport. Early specialization implies a focused involvement on one sport and a large number of deliberate practice activities with the goal of improving sport skills and performance during childhood. This paper proposes seven postulates regarding the role that sampling and deliberate play, as opposed to specialization and deliberate practice, can have during childhood in promoting continued participation and elite performance in sport.

Keywords: early development in sport, youth sport programs, early sampling, early specialization, sport expertise.

Sport is an activity that requires the integration of several human abilities and processes. Using an action-theory approach, Hackfort (2006) discussed the interaction of multiple processes in the development of elite performance in sport. For example, looking at the development of expertise with sport in an action-theory perspective, it is possible to consider the affective (i.e., enjoyment, motivation) and social (i.e., interaction with others,

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isolation) benefits and costs associated with specific types of training and activities at different stages of development in sport.

Action-theory focuses on the person, the task, and the environment (the action situation; Nitsch & Hackfort, 1981; Hackfort, 1986), taking into account the cognitive, affective, and social aspects of sport performance (Hackfort, 2006). The physical processes involved in sport are obvious and include learning fundamental movement skills such as running, throwing, kicking, and catching, as well as more complex sport-specific skills such as serving in tennis and shooting in basketball. All sport activities also require a high degree of cognitive-perceptual ability, such as the capacity to perceive various stimuli and make appropriate decisions during games and performances. Furthermore, affective abilities, such as staying motivated and monitoring emotions, are needed to successfully perform sporting activities. Finally, all sporting activities take place in a social environment and necessitate, among other things, the ability to interact effectively with coaches, parents, and peers. Action-theory provides an integrative framework for the analysis and development of elite performance in sport.

In contrast, cognitive theories, such as information-processing approaches, rely on the use of computational metaphors and terminology to describe human performance. Cognitive models of skill acquisition are concerned with the acquisition of mental structures and processes that resemble a computer-oriented way of processing and acting. The expert performance approach and the framework of deliberate practice (Ericsson, 2003; Ericsson, Krampe, & Tesch-Römer, 1993) are examples of cognitive approaches to the development of expertise in sport. According to Ericsson et al. (1993), deliberate practice is defined as a highly structured activity that requires effort, generates no immediate rewards, and is motivated by the goal of improving performance rather than inherent enjoyment. Ericsson et al. suggested that it would be next to impossible for a late starter to overcome the early advantage of those who begin deliberate practice at a young age and maintain high amounts of deliberate practice hours over time.

Although the positive relationship between time spent in practice and elite performance is consistent in sport research (see, e.g., Helsen, Starkes, & Hodges, 1998; Hodges & Deakin, 1998; Hodges & Starkes, 1996; Starkes, Deakin, Allard, Hodges, & Hayes, 1996), several other dimensions of the theory of deliberate practice have not been supported (Abernethy, Farrow, & Berry, 2003; Singer & Janelle, 1999). For example, the framework of deliberate practice focuses on cognitive learning mechanisms, largely downplaying the affective, personal, and social aspects associated with this type of practice, especially in the early years of an athlete's involvement in sport. One model that highlights the importance of appropriate training patterns and social influences throughout sport development is Côté and colleagues' Developmental Model of Sport Participation (DMSP; Côté, 1999; Côté, Baker, & Abernethy, 2003, 2007; Côté & Fraser-Thomas, 2007). The DMSP proposes two distinct types of early sport environment that can potentially lead to elite performance in sport: early sampling or early specialization. The choice of a specific pathway is associated with activities, processes, and outcomes that are unique to the early years of sport involvement.

Early Sampling

The foundation of the sampling years during childhood is based on two main elements: 1) involvement in various sports and 2) participation in deliberate play. First, partaking in a variety of sports allows children to experience a number of different physical, cognitive, affective, and psycho-social environments. The multiple abilities acquired through involvement in various sports during childhood will provide children with the foundational physical, personal, and mental skills required to specialize in one sport during adolescence. Sampling various sports allows children to experience different social interactions with peers and adults (i.e., coaches and parents) and reinforces the adaptation of emotional and self-regulating skills that can be positively invested in one sport in the future.

A second element of the sampling years is involvement in a high amount of play activities. Côté et al. (2003) discussed the importance of playing sport games informally during childhood, yet within a structure that is carefully weighed and considered for maximizing enjoyment. This type of play was described as "deliberate play," a term which was chosen to characterize the intentional and voluntary nature of informal sport games in contrast with three other types of activities: 1) the free play activities of infancy and early childhood (Denzin, 1975; Piaget, 1962), 2) the "structured practice" activities typical of organized sport, and 3) deliberate practice activities (Ericsson, 2001; Ericsson et al., 1993). Deliberate play shares the contextual characteristics of free play activities such as running, climbing, jumping, and rough-and-tumble play (Denzin, 1975; Pellegrini & Smith, 1998; Piaget, 1962), yet displays more organized and unique behavioral patterns. Furthermore, contrary to practice activities generally designed to improve performance, deliberate play activities are designed to maximize inherent enjoyment. According to Côté et al. (2007), deliberate play activities, for example "street hockey" or "backyard soccer," are regulated by flexible age-adapted rules and are set up and monitored by children or an involved adult. Children typically modify the rules of an organized sport to find a point where their game most resembles the actual sport but still allows for play at their level. The informality of deliberate play allows children to engage in sports with minimal equipment, in any kind of space, with any number of players, and with players of different ages and sizes. This kind of environment is easily created and does not necessarily require characteristics of formal organized sport and structured practice, such as adult supervision, coaches, officials, specialized equipment, time limits, or uniforms.

Through sampling various sports and engaging in deliberate play, the sampling years are considered essential building blocks for self-regulated investment in elite sport during adolescence and adulthood.

Early Specialization

The early specialization pathway is characterized by a high volume of deliberate practice and a low amount of deliberate play in one sport and focuses on performance as early as age six or seven. Several studies support early specialization as a suitable path

toward elite performance (see Ward, Hodges, Williams, & Starkes, 2004 for a review). Ericsson et al. (1993) defined deliberate practice as any training activity 1) undertaken with the specific purpose of increasing performance (e.g., not for enjoyment or external rewards), 2) requiring cognitive and/or physical effort, and 3) relevant to promoting positive skill development. Although studies in sport may support the fact that deliberate practice activities can result in pleasurable or enjoyable affects (Starkes, 2000), deliberate practice activities are generally defined as being extrinsically motivated, being literal, focusing on outcomes rather than processes, and having somewhat rigid rules. Ericsson et al. (1993) suggested that "…the higher level of attained elite performance, the earlier the age of first exposure as well as the age of starting deliberate practice" (p. 389). The deliberate practice framework is therefore in line with an early specialization pathway to elite performance.

Support for an early specialization pathway is based on the assumption that early specialization and deliberate practice in one sport is superior to deliberate play and involvement in various sporting activities during childhood for promoting elite performance in adults. Early specialization implies a focus on a rigid skill-based model, an early selection of "talented" children, an increase in resources for a special group of athletes during childhood, and a training regimen that is not always consistent with children's motivation to participate in sports. Although there is some sport research that supports a positive relationship between deliberate practice training and elite performance (e.g., Helsen et al., 1998; Hodge & Deakin, 1998; Hodges & Starkes, 1996; Starkes et al., 1996), few studies have shown that 10,000 hours of deliberate practice is indeed a prerequisite for expert performance in sport. On the contrary, expert performance in sports where peak performance is reached after maturation has been achieved with 3,000 to 4,000 hours of sport specific training (i.e., deliberate practice; see Côté et al., 2007 for a review).

Pathways of Development in Sport: Seven Postulates

Adult expert performance in sport is difficult to predict from sport performance in childhood. In a review of the talent detection and development in sport literature, Régnier, Salmela, and Russell (1993) concluded that the long-term prediction of talented athletes is unreliable, especially when detection of talent is attempted during the prepubescent or pubertal periods of growth. Sport programs that focus on early specialization are designed with the long-term objective of producing elite level athletes. In contrast, sport programs that focus on early sampling focus on serving the needs of children through enjoyment of various activities and play.

It is important that sport programs in childhood focus on the development of sport skills while maximizing participation and minimizing dropout. We can use the coefficient of efficiency to measure the quality of a childhood sport program by accounting for the dropout rate in the same sport from childhood to adolescence. The coefficient of efficiency could be used as an indicator of the internal efficiency of a sport program for children (e.g., ages 6-12). The coefficient of efficiency is the equivalent of an input-output ratio expressed as a percentage of the actual number of children that participate in a specific

sport program at a given time (e.g., at age 10) over the number of the same children that participate in the same sport at a later time (e.g., at age 13). A coefficient of efficiency of less than 100% from childhood sport participation to adolescence sport participation would indicate that certain children have dropped out of a specific sport and are no longer available to train for elite performance in this sport. Early specialization sport programs, with their strict emphasis on early selection, skill acquisition, and training during childhood, might reduce their coefficient of efficiency and eliminate someone who, through growth, maturation, and training, would later have developed into an elite level athlete (Wiersma, 2000). The underpinning principle of highly efficient sport programs for childhood through early sampling is to provide space, opportunities for playing and training, and equipment for a large number of children across various sports, so that the best athletes among a large pool of motivated adolescents can be selected.

The following are seven postulates associated with the different pathways of the DMSP that have received various levels of empirical support. The postulates highlight the efficiency of sport programs based on early sampling and the physical and personal benefits of early sampling during childhood.

Postulate 1: Early diversification (sampling) does not hinder elite sport participation in sports where peak performance is reached after maturation.

Studies of elite athletes in ice hockey (Soberlak & Côté, 2003), field hockey, basketball, and netball (Baker, Côté, & Abernethy, 2003), baseball (Gilbert, Côté, Harada, Marchbanks, & Gilbert, 2002; Hill, 1993), tennis (Carlson, 1988; Côté, 1999; Monsaas, 1985), triathlon (Baker, Côté, & Deakin, 2005), and rowing (Côté, 1999) have found that elite performance in these sports is usually preceded by a period of sampling various sports. A common characteristic of these sports is that the age of peak performance usually occurs after the athlete has fully matured, generally in the late 20s or early 30s. Typically, athletes in these sports will specialize in their main sport around age 13-15 and fully invest in their training around age 16.

On the other hand, in sports such as women's gymnastics or women's figure skating where peak performance usually occurs before full maturation, athletes do not benefit from a period of sampling or diversification. Studies of gymnasts (Law, Côté, & Ericsson, 2007) and figure skaters (Starkes et al., 1996) have shown that early specialization is a strong predictor of elite performance in these sports. It is important to keep in mind that peak performance in these sports generally occurs in the middle and late teens, thus indicating the value of early specialization.

Postulate 2: Early diversification (sampling) is linked to a longer sport career and has positive implications for long-term sport involvement.

A study of Russian swimmers (Barynina & Vaitsekhovskii, 1992) demonstrated that athletes who began specialized training in swimming around age 12-13 spent a longer time on the national team and ended their sport careers later than swimmers who specialized at around age 9-10. Gould, Tuffey, Udry, and Loehr's (1996) study of burnout in elite

tennis players showed that a sole focus on tennis at a young age led to more youth sport dropout/burnout. Furthermore, intense and repeated training in one sport at a young age has been associated with higher rates of injury (Law et al., 2007), which ultimately has an effect on the length of a sport career. Wall and Côté (2007) reported that young, elite, dropout ice hockey players began off-ice training (for the purpose of improving hockey performance) at a younger age and invested significantly more hours per year in off-ice training at ages 12-13 than a group of invested, young, elite, ice hockey players who did not drop out. These results, along with the results of other qualitative studies of dropout and burnout athletes (e.g., Carlson, 1988; Gould et al., 1996), indicate that engaging in more sport-specific training activities at a young age may shorten athletes' careers. A study of Master triathletes showed that sampling a range of sports during childhood was associated with participation that extended into late adulthood (Baker et al., 2005).

Therefore, early specialization has been shown to shorten peak performance, increase drop out/burn out, and increase injuries in young athletes. Athletes in sports where peak performance is reached after maturation generally have a longer career than athletes from sports where early specialization is the norm, such as women's gymnastics and figure skating.

Postulate 3: Early diversification (sampling) allows participation in a range of contexts that most favorably affects positive youth development.

The influence of different sport environments on positive youth development is an area of research that has received little consideration. Nevertheless, it is obvious that different sports offer distinct social contexts and opportunities for socialization. For example, a tennis player may spend a greater amount of one-on-one quality time with an adult (i.e., coach) than a basketball player will. On the other hand, the broader social system of a basketball team may provide learning experiences that are not available in an individual sport such as tennis. Even sports that are similar in terms of structure (e.g., soccer and field hockey) can result in very different types of experiences because of the unique context (e.g., different teammates and coaches) in which they take place. Therefore, it is suggested that early diversification has the potential to promote a broader spectrum of developmental experiences and outcomes than early specialization. In support of this postulate, Wright and Côté (2003) showed that diversified sport experiences during childhood fostered positive peer relationships and leadership skills in university level athletes. Longitudinal studies have found that youth who are involved in varied activities score more favorably on personal and social outcome measures such as well being (Busseri, Rose-Krasnor, Willoughby, & Chalmers, 2006) and positive peer relationships (Fredricks & Eccles, 2006) than those who specialize. Furthermore, Fredricks and Eccles concluded that adolescents' involvement in a greater number of extracurricular activities was associated with better psychological adjustment and school belonging.

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

From a motivational perspective, children become involved in deliberate play because of their own interest in the activity, as opposed to external reasons such as improving performance or winning medals (Soberlak & Côté, 2003). This type of early involvement in sport may help children become more self-directed toward their participation in sport (Ryan & Deci, 2000; Vallerand, 2001). Self-determination theory predicts that early intrinsically motivating behaviors (e.g., deliberate play) will have a positive effect over time on an individual's overall motivation and ultimately the individual's willingness to engage in more externally controlled activities (e.g., deliberate practice). Furthermore, promoting a deliberate play environment during the sampling years is closely linked to creating a "mastery" or "task" climate in sport that will ultimately foster children's motivation for sport (Biddle, 2001; Treasure, 2001). This type of motivational climate and activities that promote intrinsic motivation during the sampling years will subsequently help children become more self-determined and committed in their future participation in sport.

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.

From a skill acquisition perspective, deliberate play serves as a way for youth to explore their physical capacities in various contexts and at a minimal cost in terms of resources. Qualitative analyses of children's early involvement in sports such as tennis (Carlson, 1988; Côté, 1999), rowing (Côté, 1999), and baseball (Hill, 1993) showed that deliberate play-like activities were important in the first few years of elite athletes' engagement in sport. Soberlak and Côté (2003) showed that elite hockey players spent slightly more time in deliberate play activities than deliberate practice activities before age 20.

Deliberate play activities involve an engagement of time in physical activities that is difficult to match with any kind of structured practice. When children play one-on-one basketball in a driveway for two hours, there are few periods of waiting like those found in a structured practice. Although there are obvious advantages to having a coach available to provide feedback during practice, monitor success, and provide instruction, it is unclear whether, during early stages of development, the benefits of organized practice are superior to the benefits gained from engagement in deliberate play activities.

Postulate 6: Around the end of primary school (about age 13), children should have the opportunity to either choose to specialize in their favorite sport or to continue in sport at a recreational level.

Early adolescence (i.e., ages 13-15) is an important period for the development of psychological processes, such as identity and competence (Lerner, Freund, De Stefanis, & Habermas, 2001). Relating this to sport, MacPhail, Gorely, and Kirk (2003) conducted an 18 month-long ethnographic study of an English athletic club and noted "a shift of position" of its members from sampler to specializer in the 12-15 age range. During

that period, the young athletes decided to focus their energy and resources on specific sporting activities in order to develop their competence and achieve a higher level of performance in fewer selected sports. Horn and Harris (2002) suggest that it is only at about the age of 12 or 13 that children are able to fully understand the effects that effort, practice, and ability have on their competence and performances. Therefore, the quality of early learning experiences through sampling and play during childhood develops perceptions of competence, which in turn leads to motivation for continued participation during adolescence (Kirk, 2005). The important characteristics that mark the transition between the sampling and the specializing or recreational phases in early adolescence include a reduction in the number of sporting activities, an increase in practice hours and/or intensity of practice, a greater emphasis on competition and success, and more support provided by the family, school, and club (MacPhail & Kirk, 2006).

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

Soberlak and Côté (2003) showed that the total accumulated hours of sport-specific practice of professional ice hockey players from the age of 6 to 20 was 3,072 hours, of which an average of 459 hours was accumulated during the sampling years (representing 10% of the total hours invested). Conversely, an average of 2,215 hours of sport specific practice occurred during the investment years (representing 56% of the total hours invested). These findings support evidence from previous studies (e.g., Baker et al., 2003; Bloom, 1985; Côté, 1999; Helsen et al., 1998), identifying the investment years as the period in which elite athletes are devoted to specialized training. In a review of developmental factors that affect sport participation, Patel, Pratt, and Greydanus (2002) suggested that late adolescents have the psychological, social, emotional, and physical maturity to meet the demands of competitive sports. Individuals at this stage of development also have the capacity to understand the benefits and costs of intense focus on one sport and are able to make an independent decision about investing in a particular sport.

Conclusion

It appears that the current trends in sport programming are characterized by institutionalization, elitism, early selection, and early specialization (Hecimovich, 2004; De Knop, Engström, & Skirstad, 1996; Hill, 1988; Hill & Hansen, 1988). Many sport programs are requiring higher levels of investment from earlier ages and are discouraging children from participating in a diversity of activities (Ewing & Seefeldt, 1996; Hecimovich, 2004; Gould & Carson, 2004; Hill, 1988; Hill & Hansen, 1988). However, there seems to be clear evidence suggesting that sport programs such as these may not be providing an optimal environment for youths' lifelong involvement in sport or even for future success in elite participation (Côté et al., 2007; Guellich, Emrich, & Prohl, 2004).

The seven postulates presented in this paper highlight the benefits of early sampling

for continued sport participation and elite performance. With early sampling, children will learn emotional, cognitive, and motor skills through deliberate play activities and involvement in several sports that will prove important to their later investment in sport. By the time athletes reach adolescence, they will have learned fundamental movement skills during the sampling years and will have gained more mature cognitive and emotional skills.

The question in the title of this paper needs to be answered in a multifaceted way, and the action-theory perspective can be of help in finding a differentiated set of appropriate answers that will consider the specific sport, the person and his or her individual development, and the environment. The decision to choose an early sampling or early specialization pathway involves several trade-offs. Accordingly, before embarking on a specific type of activity and training, athletes, parents, and coaches should weigh the potential health, psychological, sociological, and motor benefits and risks associated with early sampling or early specialization in children ages 6-12. The seven postulates presented in this paper are supported by various levels of empirical support; however, continued research is necessary to test the assumptions presented in this paper concerning early sport participation.

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