

THE PATH TO EXPERTISE IN YOUTH SPORT: USING A RETROSPECTIVE INTERVIEW IN THREE DIFFERENT COMPETITIVE CONTEXTS¹

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Summary.—The goal of this study was to identify contextual factors in the path to excellence in youth sport. 48 male athletes under 17 years of age ($M=15.7$ yr., $SD=1.0$) from a soccer academy ($n=20$), a volleyball club ($n=14$), and an elite volleyball center ($n=14$) participated in the study. A standardized, retrospective interview was administered. Demographic information, training loads, and incidence of injuries were also collected. Male soccer players had more years of practice in sport than their male volleyball peers, but elite male volleyball players practiced more hours per week than the other athletes. The perception of intensity of training, physical effort, and concentration in male soccer players was higher than in male volleyball players. The high demands of expertise in professional soccer leads young athletes to begin training at early ages. The results showed that the environment specificity shapes the way young male athletes perceive their participation and commitment in sport.

Success in sport and its causes have always interested sport scientists. It is not yet fully understood how biological, social, or psychological characteristics, family background, training conditions, etc., interact and affect performance in a developmental perspective (Lidor & Lavyan, 2002; Abbott & Collins, 2004). Recent research (Fraser-Thomas & Côté, 2009; Krebs, 2009) presented environmental factors as affecting the scope of expertise, corroborating the Deliberate Practice Theory that postulates natural talent is not the only factor determining the achievement of excellence (Chi, 2006).

Deliberate practice is a highly structured activity with an explicit goal to improve performance. In this activity, specific tasks are invented to overcome weaknesses; these tasks may not be inherently enjoyable or require effort, and performance is carefully monitored to provide clues to improve it. Individuals are motivated to practice because practice improves performance. Deliberate practice to become an expert extends over a period of at least 10 yr. and involves optimization within several constraints. Engaging in deliberate practice generates costs associated with access to teachers and training environments and generates no immediate monetary rewards. Deliberate practice is effortful and can be sustained

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only for a limited time each day during extended periods without leading to exhaustion. To maximize gains from long-term practice, individuals must limit practice to some extent of time that enables them a complete recovery on a daily or weekly basis and must avoid exhaustion (Ericsson, Krampe, & Tesch-Romer, 1993).

Excellent performance in sport has a strong positive relationship with the accumulated number of hours of practice, and the specialization years are seen as decisive in improving an athlete's skill, readiness, and commitment (De Bruin, Rikers, & Schmidt, 2007; Gonçalves, Figueiredo, & Coelho e Silva, 2009). This point of view, translated to the youth sport domain, means that if an athlete wants to be a high performer, he must engage in deliberate practice during the specialization years, spending time wisely and always focusing on tasks that challenge current performance.

The Deliberate Practice model raises an important issue to sport pedagogy because it led the sport organizations responsible for the development of young sport talents to increase the number of hours spent in organized practice, under the supervision of specialized coaches at increasingly lower ages. It seems reasonable that if the young athletes are better selected, have better training conditions and practice sessions, and compete more time with better teammates and opponents, the chance of becoming competent adult athletes is greater. The 10,000-hr. rule and the Long-Term Athlete Development model (Ericsson, Prietula, & Cokely, 2007; Bályi & Williams, 2009) express this perspective, proposing a training volume sequentially balanced through more or less 10 yr. of sport specialization. Many sport organizations have created specialized training centers where selected young talents practice under the supervision of experienced coaches in order to integrate youth national teams and to produce professional athletes. In team sports, this process has been adopted by professional clubs or national sports associations and starts usually at around the age of 14 yr. In some cases, some or all of the youngsters live, go to school, and practice at the training campus, isolated from families and native environments.

A youth's decision to engage in such a program should be founded on a clear orientation toward competitive success and on a strong will to become an expert player, ready to practice at the standards of volume and intensity required by excellent performance. Although the athletes are first of all adolescents, the characteristics expected to discriminate elite players from their peers playing at a lower level are achievement orientations and the will to become experts through deliberate practice. The motivation to practice at a high level for extended periods of time is a crucial key to acquiring and maintaining expertise (Abbott & Collins, 2004). The specialization years, usually between the ages 14 and 20 yr., are the foundation of a

professional career. It is important that coaches understand how athletes during their sport development perceive the intensity of training, physical effort, focus on the tasks, and fun. All these variables are related to deliberate practice. Coaches with this knowledge have the opportunity to create better training programs that make it possible for athletes to increase the chances of improving their performance.

Many sports, at least in some countries, do not provide a safe, well-paid, professional life for expert players, i.e., the case of volleyball in Portugal, a sport where the opportunities for a professional career are scarce. In contrast, soccer attracts children and youngsters with the possibility of a rewarding professional career. Despite the status of volleyball in Portugal as an almost-amateur sport, the Portuguese Volleyball Association has created a performance center for talented young players where they live and practice under the supervision of professional coaches. The rationale for this type of organization is to offer the optimal training load to selected athletes to improve the performance of national teams in international competitions. At the same time, volleyball clubs continue to nurture their own players in their home cities, like the club whose data are presented here, considered to be an historic association in Portuguese sport.

There are three different contexts for youth team sports, although each of them have the same goal of developing an adult competitive expert player. From the athletes' point of view, it seems plausible that their expectations and desire to engage in hard practices is a function of their exposure to different environments and of their own interpretation of the meaning of those influences on their lives and careers. The opportunity for a professional career is much more evident to soccer players than to volleyball players, affecting the perspectives about the sport. Coaches and managers need to know how the players perceive and interpret their own paths to specialization and how they cope with the pressure put on them in order to improve plans, structure, and management of programs for potential talent.

In the present study, a retrospective quantitative interview (Côté, Ericsson, & Law 2005; Portuguese version from Barreiros & Fonseca, 2007) was used. The interview is segmented into different parts, and each one of them deals with different periods of the athlete's development, starting with the initial activities. The script begins with questions concerning activities undertaken by male volleyball or soccer players before starting the volleyball or soccer activity when they were children, and these activities could be sports, music, or artistic activities. The second part deals with the stages of development, maturation, and performance in volleyball or soccer. It addresses issues such as the age at which each athlete began practice, the age he decided to become an elite athlete, etc. The third and last part focuses on the development of relevant training activities of each ath-

lete in volleyball or soccer. They were asked questions about the weekly number of hours of training, as well as the perceptions of the physical effort and concentration required by each activity, in every stage of their development, as well as the fun experienced.

As the process to reach elite level is a multi-factorial one that involves genetic factors, physical capacity, mental toughness, family support, excellent coaching and training conditions, support from team peers, etc., the interview allows collection of a wide range of data related to pertinent variables of the process of sport development. According to Côté, *et al.* (2005), the intention is to collect verifiable objective measures of performance and measure improvements in performance at the most detailed level possible. As a function of development of the athletes, the authors proposed methods for eliciting information related to the amount and structure of practice-related activities and training resources, mapping various training activities and longitudinal changes of sport-participation patterns. The goal of this detailed account of longitudinal changes is to improve the understanding of how different activities contribute to the development of expertise at various stages of athletes' involvement in sports. The interview procedures are designed to assess the reliability and validity of all information reported by the athlete, allowing the researchers to adjust the questions to the particular background and development of the athletes, and yet collect information in a standardized manner.

As the three environments under analysis differed so much in terms of organization, information was collected about the training and competitive load (number of hours of practice and number of games played). As the athletes were adolescents, information about injuries and time loss was required from the coaches and athletic trainers.

Research goals. To obtain detailed descriptions of the perceptions of adolescent male athletes in three different soccer or volleyball training contexts about their development toward sport excellence; to describe the nature, quantity, and quality of activities carried out over time directly related to sport; and to analyze athletes' perceptions about the influence of mental factors for the development of excellence, particularly related to the motivation and desire to reach the elite level in sport.

METHOD

Participants

Forty-eight athletes under 17 years of age ($M=15.7$ yr., $SD=1.0$), from three different teams participated in the study: a soccer academy with 20 players, a volleyball club with 14 players, and an elite volleyball center with 14 players. The technical team of the soccer academy comprised 11 mem-

bers, one head manager, one head coach, one assistant coach, one goalkeeping coach, one coach of individuals' skills, one coach of physical skills, one psychologist, two doctors, one masseur, and one logistics technician. The elite volleyball team had one head manager, one director of logistics, one head coach, one assistant coach, and one physiotherapist. The volleyball club's technical team had one head manager, one director of logistics, one head coach, one assistant coach, and one masseur. The elite volleyball players lived and practiced in a high performance center managed by the Portuguese Volleyball Association.

Measures

The Portuguese version (Barreiros & Fonseca, 2007) of a retrospective quantitative interview from Côté, *et al.* (2005) was used. This information focuses on the longitudinal performance as well as the type and quantity of activities performed by individuals throughout their development. The interview was conducted in three different contexts.

The interview has three major categories. The first one deals with the initial activities (16 questions). The second major category approaches the stages of development, maturation, and performance in volleyball or soccer (36 questions). The third major category approaches the development of relevant training activities of each athlete in volleyball or soccer (12 questions). The answers are closed and were answered quantitatively. All variables were collected from age 6 yr. to the current or last year of athletic involvement. The assessment of the documents related to training load used a specific scoring sheet to quantify practice time and competition and "time loss injury." It also used a sheet to assess the type and location of the injury affecting the player.

Procedure

The researcher contacted the Portuguese Volleyball Association and the secretariat and coaches of the clubs. The visits to the high performance center and to the clubs took place in October and November. The interviews were done by the principal researcher in the clubs' facilities and in the training center in a meeting room.

All the participants, athletes, coaches, and legal representatives gave written permission to perform the data collection. In this document, they were elucidated about the purpose of this study and also were informed that all data collected were confidential and anonymous. On average, the data collection took about 75 min. The ethics committee of the university approved the study.

Data Analysis

The interviews were recorded manually, transcribed to a spreadsheet, analyzed by the principal researcher, and reviewed by the second author, according to predetermined categories. Variables studied related to the

initial activities were: (a) number of sport activities, (b) number of musical activities, (c) number of artistic activities, and (d) number of unstructured sports. The stages of development, maturation, and performance included athletes' age when they: (a) began supervised training, (b) began non-supervised training, (c) first appeared in the school squad, (d) first appeared in the regional squad, (e) first appeared in the national squad, (f) achieved international level, (g) started thinking they could become elite athletes, (h) started training regularly as athletes, (i) decided to invest in being elite athletes, (j) invested leisure time in training, (l) began training in summer camps, (m) moved away from home to be able to train, (n) developed close relationships with coaches, (o) reached highest potential in their sport, and (p) started thinking about retirement from sports. Sport-specific variables studied included athletes' age when they: (a) started sport-specific practice time, (b) started sport-specific play time, (c) began supervised training, and (d) began non-specific training. Athletes were asked about: relative age to training group (young, average, or older), highest personal and team commitments in sports, relative height to average population (smaller, average, or taller), average perception of intensity of training at each stage of development, average perception of qualities of facilities at each stage of development, and influence of injuries on their sport development. In regard to this last list of variables, perception of intensity of training and qualities of facilities were rated as percentages and participants were asked to think of 0% as an absence of perception of intensity of training and 100% as the maximum perception of intensity of training and then rate perception of intensity of training for each stage of development.

The development of relevant training activities of each athlete included: average perception of physical effort, level of focus in the tasks, and level of fun for each stage of development. Average perception of physical effort was rated in percentage, and participants were asked to think of 0% as an absence of perception of physical effort and 100% as the maximum perception of physical effort and then rate perception of physical effort for each stage of development. Perception of level of focus in the tasks and fun were rated similarly.

RESULTS

Training Load and Injuries

Training load in the three contexts varied substantially. The male athletes from the top soccer academy had during the season a total of 157 training sessions, completing more than 14,000 min. or 240 hr. of training. The soccer players engaged in a total of 31 matches, averaging one match per week. The male athletes from the top volleyball club had during the season a total number of 108 training sessions, as well as one match per

week. They completed 14,000 min. or 230 hr. of training and played a total of 20 matches. The male athletes from the elite volleyball team had 2 wk. of competition during the whole year, comprising eight matches. The first week of competition occurred in January, and the second was in May. During the season, they had 346 training sessions in 206 days. They completed 39,900 min. or 665 hr. of training.

The athletes from the top soccer academy had during the whole season eight injuries, the most common being muscle contractures, distensions, and sprains. The athletes from the volleyball club had during the whole season 14 injuries. There was a prevalence of injuries related to distensions and sprains, and there was a predominance of the number of injuries that were not a recurrence. In both clubs, the athletes stopped the activity during the recovery period. The athletes from the elite volleyball team had during the whole season just three injuries that kept the players inactive. All injuries were characterized as distensions or sprains (see Table 1).

Interviews

In the first category, initial activities, it appeared that the athletes from the volleyball club had the highest number of activities performed before they began their main sport (Table 1).

The analysis of the second category, stages of development, maturation, and performance in volleyball or soccer, indicated that the male soccer players started soccer practice at the youngest mean age, followed by the elite volleyball team and volleyball club. Soccer players had the highest mean of 7.6 yr. of practice, followed by the elite volleyball team, and finally the volleyball club. The mean number of hours of deliberate practice of the athletes from the top soccer academy during their sport development was midway between that of the volleyball club and elite volleyball team. The soccer players decided to become specialized athletes earliest, followed by the volleyball club; the elite volleyball team members were oldest when they chose their specialty. The athletes from the top soccer academy and the athletes from the volleyball club began complementary activities (strength training) at about the same age, and predictably the elite volleyball team began later.

The average perception of the intensity of training of the athletes from the top soccer academy during their sport development was 76.5%. The athletes from the volleyball club had, on average, a perception of intensity of training of 55.9%, and the athletes from the elite volleyball team, 43.1%.

The analysis of the third category, development of relevant training activities, showed that the male soccer players during their sport development had a perception of physical effort of 61.5%. The male athletes of the volleyball club scored 57%, and the male athletes from the elite volleyball

TABLE 1
QUANTITATIVE DATA FROM INTERVIEWS

Variable	Top Soccer Academy	Top Volleyball Club	Elite Volleyball Team
Initial activities			
Number of activities before main sport	1.4	3.7	2.7
Age started volleyball/soccer, yr.	8.1	10.8	10.7
Yr. of practice of volleyball/soccer	7.6	4.1	5.1
Hr. of deliberate practice	1,382	808	1,705
Training			
Number of training sessions	157	108	346
Hr. of training	240	230	665
Games played	31	20	8
Number of injuries	8	14	3
Start of practice			
<i>M</i> age	8.5	10.8	10.7
<i>M</i> yr. of practice	7.6	4.1	5.1
<i>M</i> hr. of deliberate practice	1,382	808	1,705
Specialization			
<i>M</i> age at decision to specialize	12.2	13.0	14.6
<i>M</i> age began specialized activities ^a	13.5	13.5	14.8
<i>M</i> perception of intensity during development	76.5	55.9	43.1
Sport development			
<i>M</i> perception of physical effort	61.5	57.0	41.9
<i>M</i> perception of focus in tasks	73.5	60.7	51.2
<i>M</i> perception of fun	88.0	68.7	66.9

^aStrength training

team 41.9%. During their sport development, the soccer players perceived their level of focus in the tasks as 73.5%. The athletes from the volleyball club scored 60.7%, and the athletes from the elite volleyball team, 51.2%. The soccer players during their sport development had a perception of fun of 88%. The athletes from the top volleyball club scored 68.7%, and the athletes from the elite volleyball team, 66.9%.

DISCUSSION

Training Load and Injuries

The results showed a huge difference in the time of practice between the elite volleyball team and their club peers, with the first group having more training sessions. On the other hand, they competed very little, only

in the qualifying round of the European Championship. This fact raises the question if the low perceptions of intensity, physical effort, focus on the tasks, and fun were related to a sense of isolation and of lack of interaction with their peers through competition. The group that expressed the highest average for fun was the soccer team, which competed frequently during the whole season.

Despite the fact they trained twice a day, the male elite volleyball team did not show, in quantitative terms, a greater number of injuries than soccer and club volleyball players, although some injuries were reported that did not stop the athletes to continue practice. In fact, the athletes from the volleyball club reported the highest number of injuries. The medical assistance provided at the high performance center, distance from family, and the immersion in an all-sport environment may cause more pressure on the young elite athletes to accept the motto "no pain, no gain." Zetou, Malliou, Lola, Tsigganos, and Godolias (2006) argued that in volleyball, most of the injuries are related to the demands of the game. Most of the injuries are caused when jumps take place close to the net and players try to perform an act of attack or defense against the opponents' attack or during attempts to reach a difficult ball, involving a possible dive or fall. The competitive season of the elite volleyball players was very short and intense.

Initial Activities

This study aims to analyze the development of excellence in sport, particularly the relationship between personal perceptions of participation and contextual factors. In this sense and according to the results, the athletes from the volleyball club showed the highest average on the number of activities before they engaged in their main sport. The fact that these athletes practiced more activities did not appear to give them a sport advantage compared to their peers, despite Côté's (1999) advice that young athletes should practice several activities before they specialize. Early diversification of motor experiences, with different rules and different training and game environments, should have positive consequences for the athletes. Hence, the involvement in several sports should happen during the initial years. The results seem to corroborate the claims of elite coaches who urged early specialization and focused practice to reach higher sport achievement. A unique path to sport success is suggested by these personal experiences, especially in the case of soccer.

Stages of Development, Maturation, and Performance

The male soccer players reported a greater number of years of specialized practice than the male athletes of both volleyball teams. This probably happened due to the popularity of soccer and the offer of training activities from the clubs, starting at the age of 6 yr. The opportunities to play oth-

er sports are less frequent and more localized, leading the families to prefer an early engagement in the main sport. A possible factor to influence early participation in soccer is the talent identification process, in which the club scouts try to select young skilled players at very young ages, as indicated by the younger age at which soccer players chose their specialization. Literature (Helsen, Hodges, Van Winkel, & Starkes, 2000; De Bruin, *et al.*, 2007; Gonçalves, Coelho e Silva, Carvalho, & Gonçalves, 2011) emphasized that excellent performance in sport has a strong positive relationship with the accumulated number of hours of practice; if an athlete wants to be a high performer, deliberate engagement in practice during the learning and specialization years, spending time wisely, and focusing on tasks that challenge the current performance (Ericsson, 1996) are necessary. Other authors (Côté, Baker, & Abernethy, 2003; Light, Harvey, & Memmert, 2013) stated that early specialization does not necessarily mean that an athlete is going to reach the elite level. According to them, it is wiser to delay the specialization process because different sports environments could give an interesting motor experience that the athlete could later use in their main sport, and this delay has the potential to avoid the risks of injuries, burnout, or dropout.

The athletes from the elite volleyball team had during their sport development more hours of deliberate practice than soccer players and the volleyball club. According to the 10,000-hr. rule (Ericsson, *et al.*, 2007; Bályi & Williams, 2009) and a training volume sequenced over 10 yr. of sport specialization, the athletes are all far from the desired deliberate practice to reach the elite level, perhaps because they had only 4 to 7 yr. of practice at these ages.

Abbott and Collins (2004) claimed that appropriate learning strategies and motivation appear to be important factors of development capacity and characterize individuals who obtain the greatest success within sport and other performance domains. For individuals to reach their full potential, they must exhibit and possess the motivation and learning strategies to interact effectively with the development opportunities offered by the environment. Athletes from the elite volleyball team began much later when they decided to specialize. Selection to the high performance center was an extrinsic influence, in this case, the national coaches' invitations to join the elite center, that led these youngsters to specialize and to begin the complementary activity.

Soccer players had stronger perceptions of training intensity than the athletes of the volleyball club, possibly due to the competitive climate, where soccer athletes were under pressure to show their skills and readiness for competition. However, the elite volleyball players had the lowest perceptions, despite practicing twice per day and living in a training center. Possibly, biological and psychological adaptation to increased training loads characterize the athletes who succeed in coping with training de-

mands and effort. The same pattern was seen in responses to the question about perception of physical effort. Adaptation to effort could be slower in club players who practice four or five times per week than for the volleyball elite athletes.

Development of Relevant Training Activities

Regarding the question about focus on tasks, the elite volleyball players' scores were lower than those of club players. The professional setting is more demanding and competitive, explaining the soccer results, but it is not the case for the volleyball club athletes, and even so, they scored almost 10% higher than the elite athletes. With two long practice sessions per day, perhaps the elite volleyball players can adapt to maintain a moderate attention, avoiding stress and burnout. These results are contrary to Ericsson (1996), who said athletes must be completely concentrated on sport goals and performance to make elite performance possible.

One important issue in youth sport is the place and role of fun, although the definition of the concept is not very clear. It has been suggested that fun and enjoyment are essential for persistence in sport. The findings show that soccer players express a much higher perception of fun than their volleyball peers both from club or elite settings, meaning that a highly demanding, competitive context, as is the case of professional soccer, may coexist with a sense of enjoyment in practice. Bengoechea, Strean, and Williams (2004) qualify this contention by arguing that what constitutes fun and enjoyment varies between individuals and are strongly related to achievement orientations, perceptions of the climate, and relevant information from significant others. Gonçalves, Carvalho, and Light (2011), in a study with young female athletes, noted that fun seemed to be related to good practice, good competition, and a sense of accomplishment. As Long and Carless (2010) suggested, fun means little without skill acquisition and competence development. The young soccer athletes, although they played for a top professional club, had the highest mean score for the perception of fun during their sport development, compared with the male volleyball players, but the latter group still scored above 65%. Fun during practice may be a critical factor in players maintaining motivation and commitment to a sport over time (Abbott & Collins, 2004). Baker and Horton (2004) argued that the acquisition and manifestation of expert performance requires specific motivational disposition; the athlete must enjoy his sport.

Conclusion

The findings seem to corroborate the assumptions of the Deliberate Practice model and the choices of the sport organizations. The participation in different activities before starting to practice a single sport does not seem to affect reaching elite performance. The specificity of the environ-

ment shapes the way young male athletes perceive their participation and commitment in sport. Recruitment influences the decision to specialize in soccer and work toward being an elite player at a younger age than for volleyball players.

The athletes from the elite volleyball team engaged in twice the training volume of the two other groups, but they competed less and reported lower focus and enjoyment. The soccer players, although engaged in a demanding academy, practiced the normal number of hours per week, competed much more, and reported higher enjoyment. On all the parameters characterizing a positive sport environment, the soccer players scored higher, and the elite volleyball players scored the lowest. The choice of national associations to identify and recruit sport talents to provide ideal conditions for their evolution to expert adult players may have negative effects in their perceptions of the environment. The training environment plays a major role in the young athletes' perceptions and decisions and is a key factor in differentiating the soccer players from their peers.

However, the research presents some limitations. First of all, the research is based on a retrospective, one-on-one interview, complemented with information about the training load and injuries. The study of the environment must include the analysis of the organizations, qualitative studies, and ethnographic methods. The claim from sport organizations that there is no alternative to their model to develop competitive athletes at an adult level is based in the possibly faulty assumption that it is possible to discriminate elite from non-elite and talent from non-talent at adolescence (e.g., Ré, Corrêa, & Böhme, 2010; Vântinnen, Blomqvist, Luhtanen, & Häkkinen, 2010; Ré, Cattuzzo, & Monteiro, 2013). This has to be confirmed in the future through the study of the evolution of these athletes in the subsequent years. Longitudinal studies, for longer periods of time, are needed.

The foundations of sport for children and youth are their positive, holistic effects that last for the entire life span. Competitive sport has the ingredients to become an important part of that positive experience. Only for a few, elite sport can be a rewarding career. The findings of this study point out that adult sport organizers must never forget that youth sport deals with individuals in a development process and that they need to be supported and protected from harm.

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