Children and youths in athletics

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Introduction

Children's and youths' athletics is a broad, multifaceted topic. Key aspects that have been the focus of attention in recent years include:

- Physical and motor development
- Talent, including selection, identification and development
- The training of children and youths
- The dropout problem
- International competition for young athletes

The purpose of this paper is to provide an overview of the key background information and current thinking on these issues as a starting point for more detailed study and discussion.

Definitions of 'child' and 'youth' and related terms

Before dealing with the aspects in detail it is useful to look at some terminological questions. According to Webster's New Third International Dictionary, a child is "a young person of either sex esp. between infancy and youth." An infant, again according to Webster's, is either "a child in the first year of life" or "a child several years of age," a youth is "a young person between the ages of adolescence and maturity", and adolescence is "the period of life from puberty to maturity terminating legally at the age of majority."

The definitions provided by Collins English Dictionary (1998) are more straightforward. Here a child is defined as "a boy or girl between birth and puberty" while youth is "the period between childhood and maturity, esp. adolescence and early adulthood". An adult is "a person who has attained maturity" or "a person who has attained the age of legal majority (18 years for most purposes)".

From these definitions it might be concluded that a child is a person below the age of 14 while a youth is a person between the age of 14 and 18. However, there is no general agreement concerning the definition of "youth" and the age in which a person is considered a "youth", and thus eligible for special treatment, varies around the world. For example, according to the United Nations General Assembly, youths are "those persons falling between the ages of 18 and 24 years inclusive" and the Commonwealth Youth Programme even works with "young people (aged 15-29)" (Wikipedia). International sports organisations, however, seem to agree with the dictionaries' definition of "youth". For example, the Youth Olympic Games (YOG), which the International Olympic Committee (IOC) Executive Board announced on 26 April 2008 are to take place for the first time in the year 2010, will feature athletes between the ages of 14 and 18.

Physical and motor development

Muscle mass, balance, agility and coordination

Muscle mass increases steadily along with weight gain from birth through adolescence. In

boys, the rate increase peaks at puberty, when there is a dramatic increase in testosterone production. Girls do not experience this sharp increase. Muscle mass increases result primarily from fibre hypertrophy (increase in the size of muscle fibres) with little or no hyperplasia (increase in the number of muscle fibres). Muscle mass reaches its peak in girls between ages 16 and 20 and in boys between ages 18 and 25, although it can be further increased through exercise and/or diet. Balance, agility, and coordination improve as children's nervous systems develop (WILMORE & COSTILL, 2004, pp. 516, 518).

Strength

Strength improves as muscle mass increases with age. Gains in strength with growth also depend on neural maturation because neuromuscular control is limited until myelination (the process of acquiring a myelin sheath around the nerve fibres) is complete, usually around sexual maturity. Peak strength is usually attained by the age of 20 in women and between ages 20 and 30 in men. The hormonal changes that accompany puberty lead to marked increases in strength in pubescent males because of the increased muscle mass noted above. Girls experience a more gradual increase in strength and do not exhibit a marked change in their rate of strength gain with puberty (WILMORE & COSTILL, 2004, pp. 518-519).

Cardiovascular, respiratory, and metabolic function

During both submaximal and maximal exercise, a child's smaller heart and blood volume result in a lower stroke volume than in adults. In partial compensation, a child's heart rate is higher than an adult's for the same rate of work. Even with increased heart rate, a child's cardiac output remains less than an adult's. In submaximal exercise, an increase in arterial-mixed venous oxygen difference ensures adequate oxygen delivery to the active muscles. But at maximal work rates, oxygen delivery limits performance in activities other than those in which the child merely needs to move his or her body mass, such as in running.

All lung volumes increase until physical maturity, primarily because of increasing body size. Until physical maturity, maximal ventilatory capacity and maximal expiratory ventilation increase in direct proportion to the increase in body size during maximal exercise.

As pulmonary and cardiovascular function improve with continued development, so does aerobic capacity. VO_2max peaks between ages 17 and 21 years in males and between 12 and 15 years in women, after which it steadily decreases. The child's lower VO_2max value (L/min) limits endurance performance unless body weight is the major resistance to movement, such as in distance running. When expressed relative to body weight, a child's VO_2max is similar to an adult's, yet in activities such as distance running, a child's performance is far inferior to adult performance. Also, running economy is lower in children compared with adults, when VO_2 is expressed relative to body weight. This difference can be explained by the difference between children and adults in stride frequency for the same fixed-pace run.

Children's ability to perform anaerobic activities is limited. A child has a lower glycolytic capacity, possibly because of a limited amount of phosphofruktokinase or lactate dehydrogenase. Children have lower lactate concentrations in both blood and muscle at maximal and supramaximal rates of work. Children cannot attain high respiratory exchange ratios during maximal or exhaustive exercise, suggesting less lactate production. Anaerobic mean and peak power outputs are lower in children than in adults, even when scaled for body mass (WILMORE & COSTILL 2004, pp. 519-525).

Physiological adaptations to exercise training

Training-induced body composition changes in children and adolescents are similar to those seen in adults: loss of total body weight and fat mass and increase in fat-free mass. Resistance training during childhood and adolescence can lead to stronger, broader and denser bones. Strength gains achieved from

resistance training in children are primarily caused by improved motor skill coordination, increased motor unit activation, and other neurological adaptations. Unlike adults, children experience little change in muscle size from strength training.

Although the endurance performance of children improves with aerobic training, such training does not alter VO_2max as much as would be expected for the training stimulus, possibly because VO_2max depends on heart size.

A child's anaerobic capacity increases with anaerobic training (WILMORE & COSTILL, 2004, pp. 526-530).

Motor ability and physical performance development

Motor ability generally increases for the first 18 years of life. However, in girls it tends to plateau around puberty. This plateau is probably attributable to increased oestrogen levels, which promote greater fat deposition, and less muscle mass (WILMORE & COSTILL, 2004, p. 531).

Awareness of age range sensitivity for the development of certain physical performance factors assists in obtaining best training results. Based on a study to establish the most suitable periods for the development of strength, power and speed capacities for boys and girls in the 10-18 yrs. age range, LOKO et al. (1996) arrive at the following conclusions:

1) The sensitive period for the development of static strength occurs in the 13-16 yrs. age range for boys with the largest increase (23.4%) taking place between 14-15 yrs. The most sensitive period for girls is in the 11-13 yrs. age range in 39.7% of the total improvement.
2) The most sensitive development of leg power for boys takes place in the 12-17 yrs. age range with the best results recorded between 13 and 16 yrs. In girls the most sensitive period occurs from 10-12 yrs. During these two years (10-11 and 11-12) the standing long jump shows an improvement of 81.8%, the vertical jump 77.2% of the total achieved during seven years.
3) The most sensitive period for arm power development for boys is between 13 and 17 yrs., while the girls record their best results in the 10-13 yrs. age range.
4) The sensitive period for the development of running speed for boys falls within the range of 12-17 years, while girls achieve best results during the early ages of 10-13 years.

In general, the sensitive periods to develop various physical performance capacities are concentrated in the 12-17 yrs. age range for boys and 10-13 yrs. age range for girls.

SUSLOV (2002) points out that although most physical performance capacities improve rapidly during the "growth spurt" in the 12-16 yrs. age range, coaches should not overlook the need to develop these capacities also during the non-sensitive age periods. It should also be kept in mind that the largest increases in physical performance capacities do not occur uninterrupted during certain age ranges but frequently only every second year.

Children and thermal stress

Children are more susceptible to injury or illness from thermal stress. They are capable of less evaporative heat loss than adults because they sweat less. Heat acclimatisation is also slower in children than in adults. In cold environments children are at a greater risk of hypothermia because they have greater conductive heat loss than adults (WILMORE & COSTILL 2004, pp. 533-534).

Talent

Selection and identification

In his review of the current state of affairs concerning what talent is and how it can be best discovered and developed, TRANCKLE (2004) emphasises the lack of a clear and widely recognised definition of talent. This absence has led to the casual and frequently misleading use of the word. Since talent has been used to describe the raw material as well as the end product of a developmental process, a proposal was made to distinguish between the two.

This resulted in describing the raw material as giftedness and defining it as "the possession and use of untrained and spontaneously expressed natural abilities (called aptitude or gifts), in at least one ability domain, to a degree that places a child at least among the top 10% of his or her age peers." At the other end of the spectrum, the end product of a developmental process has been described as talent, which has been defined as "the superior mastery of systematically developed abilities (or skills) and knowledge in at least one field of human activity to a degree that places a child's achievement within at least the upper 10% of age peers who are actively in that field or fields." Although well accepted by the educational community, this distinction has been less appreciated within sport.

Instead of definitions, sport theorists and coaches are more interested in how talent can be maximised in the lives of performers. So the sport community does not usually differentiate between gifts and talents but concentrates instead on:

1) Talent detection (= the discovery of potential performers who are currently not involved in the sport in question),
2) Talent identification (= the process of recognising current participants with the potential to become elite performers), and
3) Talent development (= the provision of performers with a suitable learning environment so that they have the opportunity to realise their potential) (TRANCKLE, 2004, p. 64).

At a scientific symposium about the talent problem in sports, it was stated that scientifically valid methods for talent detection do not exist and that coaches' judgements are the best solution for detecting and identifying talent.

The following statement by KOZEL (cited by TRANCKLE, 2004, p. 71) can be regarded as a summary of the current predominate view on the issue: "Talent is an extremely complex attribute; genetically determined, complicated in structure and subject to environmental conditions. It is for this reason that there is no consensus of opinion, nationally or internationally, regarding the theory and methodology of talent identification, selection and training in sport […]. Generally, it is still the coach's eye and expert's judgment which is decisive in the talent screening and selection process."

Talent development

As far as talent development is concerned, the following stages can be differentiated (COTE, 1999, cited by TRANCKLE, 2004, p. 67):

1) The sampling years typically take place between the ages of six and 13 years. During this time, children experience fun and excitement through a range of extracurricular activities. These activities can also be called "deliberate play", which can be characterised as being voluntary, pleasurable, providing immediate gratification and developing intrinsic motivation.
2) During the specialising years children tend to narrow the focus of their involvement. This stage usually occurs between the ages of 13 and 15. Although fun and excitement remain as central elements in the children's participation, there is a growing importance placed on sport specific skill development.
3) During the investment years, which begin at about the age of 15, there is more importance placed on the strategic, competitive and skill development aspects of sport, along with an extremely intense commitment and tremendous amounts of practice.
4) The investment years (until about the age of 18 years) are followed by the maintenance years, which involve the perfection and maintenance of talent, developed during the investment years.

A slightly different model for talent development is presented by DEMPSTER (2005):

1) The FUNdamental phase (chronological age: 8-12, training age: 0): This phase is characterised by FUN and participation first and foremost. No formal training sessions are carried out. Further characteristics of this phase are:

- General overall development of the ABCs of athleticism (agility, balance, co-ordination, and speed)
- Introduction to simple tactics
- Speed, power, and endurance development through FUN games
- Introduction to running, jumping and throwing techniques
- Work with bodyweight for strength development plus medicine ball and SWISS ball
- Modified FUN competitions, emphasis on giving everyone a chance to participate
- Well-structured sessions, no periodisation
- Athletics twice per week, leaving time to practice other sports

2) The training to train phase (chronological age: 13-16, training age: 1-4): The focus in this phase is to gradually introduce the concept of training as opposed to playing. FUN is still involved, but the activities are structured and presented in more of a 'real session'. Further characteristics of this phase are:
- General physical conditioning
- FUNdamental technical skills progressing onto more specific skills towards the end of this phase
- FUNdamentals of tactical preparation
- Participation in complimentary sports using similar energy systems and movement patterns
- Gradual individualisation of fitness and technical training
- FUNdamentals of the "ancillary capacities, i.e., warm-up, cool-down, flexibility and stretching and recovery, etc.
- Single periodisation
- Loose event-specific training four times per week with participatio in other sports

3) The training to win phase (chronological age: 21-24, training age: 9-12): In this phase everything is geared towards performance. The capacity to be able to handle a heavy training schedule should be attained by this phase but full capacity in this area has not yet been reached. The key characteristics of this phase are:
- Maximal improvement of the physical capacities
- Further development of technical, tactical and playing skills
- Modelling aspects of training and performance
- Frequent prophylactic breaks
- Individualisation of all training aspects
- Fine-tuning of the 'ancillary capacities' and event-specific capacities
- Double/multiple periodisation

According to this model, the athlete is still in a development phase until his or her mid-twenties.

Factors influencing talent development

A very important factor in talent development is the influence of the teacher or coach. However, it is very rare for the same teacher or coach to progress an individual through all phases of talent development because of the different requirements at each stage of talent development. This has implications for athletes being encouraged to move on to different coaches as they advance and thus require more specialist or expert guidance (TRANCKLE, 2004, pp. 68-69).

In addition to the influence of teachers in the development of talent, a greater influence during childhood comes from the family. Talented individuals often come from so-called 'complex families,' that are both integrated and differentiated. Integrated refers to the stable conditions among family members whereby the children feel a sense of support and consistency. Differentiation refers to the notion that members of the family are encouraged to develop their individuality by seeking out new challenges and opportunities (CSIKSZENTMIHALYI et al., 1996).

This aspect is also taken up by OGILVIE (1981), who deals with the question how parents can play a wholesome supportive role in the life of the aspiring child. In OGILVIE's opinion, the ideal would be that the parent should be a guest in the life of the child. This would permit the child to remain in control and invite

the parent to share whatever they might be experiencing based upon their personal need. The child competitor should be in control of his or her own life and have total responsibility for valuing the experience in personal terms.

Talent development programmes

As far as talent development programmes in different countries are concerned, the state controlled and highly structured systems of the former Eastern bloc states must be distinguished from the less controlled, often organisation- or club-centred, and sometimes even haphazard systems of talent identification and development in the Western states.

A very informative overview of the Eastern bloc system of talent development is provided by RIORDAN (1987) and SCHÖNBERGER (1987). The basis of the sports success of the Eastern states was a well-planned development of sports. This was supported in every respect by the state, which was very favourably disposed to the promotion of children and youth sports. The search for talent in Eastern Europe used to take place within a centrally planned system of selecting, grading and sifting over a long period. The relation of coach:young athletes was 1:10. Talent selection took place in cooperation with the physical education teachers at schools. From the first school year on, physical education classes were considered as extremely important.

The general approach to identify talent was based on establishing a model for each sport and event. This model was made up of statistical data from a large number of domestic and foreign world-class athletes in the particular sport. It included information on performance at various ages and the rate of progress, the ideal morphological type, etc. With the biological age taken into consideration, the planners were able to set approximate standards of what could be expected from a potentially gifted athlete at a certain age. East Germany had individual computer-aided training analysis based on training records. Data on present and long-term training was stored so that planners could intervene directly in the training process. The data taken into consideration typically included the following:

- Anthropometric measurement (height, weight, arm reach)
- General physical performance (speed, strength, power, endurance, mobility, agility)
- Performance levels in a particular sport (sprinting, long jump, etc.)
- Sport-event specific performance ability (say, in athletics: 100 and 200m –> speed endurance, 400-1,000m –> aerobic and anaerobic endurance, 3,000 to 10,000m –> aerobic endurance, hurdles –> speed, speed endurance, mobility, agility, jumps –> power, speed, throws –> power, strength)
- Rate of progress in test indicators

Once a model had been created for a sport, the relevant standards and anticipated rate of progress were used to select potential talent in three major stages over 4-5 years:

- Basic selection
- Preliminary selection
- Final selection

When a person was identified as possessing potential talent, he or she was often offered a place at a residential sports-boarding school. For most competitive athletes, the way to the top was via the Spartakiad Games. In top-level junior sports systematic training started at the age of 10 with a general basic training. The most talented children from school sports clubs and sports groups of sections of the DTSB of the GDR continued to be coached at training centres of which, as a rule, one or more existed in each district of the country. This mainly took place at the age of 10-12/13 years. Under the guidance of experienced instructors, the systematic sports-oriented training began at this stage with the aim of realising talents. On the basis of scientific and pedagogical methods and principles, a manifold training generally prepared future high-level performers and enabled the determination of aptitude and selection of talented athletes. At the age of 14 or 15 years, the most suitable discipline for each athlete was already

quite certain. However, contrary to common belief, the East European talent identification system was not scientifically tried and tested from start to finish. Many tests were rather primitive, and the PE teacher's or coach's eye often provided the most ready information.

The training in children and youths

Early specialisation vs basic training

As outlined above, children differ from adults in many of their body responses to hard physical activity and they are not just 'little adults' physiologically (JONES, 1993). Children are adequately equipped to handle activities that require short but intensive exertion (phosphagen system) or more prolonged periods of moderate exertion (aerobic system). They are not well equipped to cope with training that demands a significant contribution from the lactacid system. Training of the lactacid system should therefore be predominantly left until after the peak of the growth spurt has been reached. Similarly children are responsive to muscular endurance training but work with heavy weights should be avoided until puberty is complete.

Training regimes introduced at the appropriate time in the child's development will induce favourable changes in the child's physiology of a similar magnitude to those expected in adults. A period of detraining will cause many of these changes to gradually decay. There is no strong evidence to support the suggestion that training must be started early in order to experience success as an adult. Moreover early specialisation is counter productive. Coaches need to be sensitive to the fact that childhood performance is often linked to the rate of maturation – early maturing boys have a distinct advantage in most sports but with girls it is often the late maturers who are successful. Children should be encouraged to internalise the motivation to exercise so that when the extrinsic motivation of the coach is removed they are not "turned off" (ARMSTRONG, 1992).

According to DICK (1980), it is fundamental to the long-term development of competition performance that the athlete has a sound technical model upon which to build, against a background of basic general strength, mobility and endurance. That is why the development of a technical model must have priority in coaching the young athlete (8-15 years for girls and 8-17 years for boys). The ranges permit exposure to a multiplicity of techniques from 8-11 years (girls) and 8-13 years (boys), followed by a period for stabilising specialised techniques. Implicit in this is that competitive success is not a priority at this juncture of the athlete's development.

GAMBETTA (1986) also holds that the first experience in athletics for the beginning athlete should emphasise the basics to provide a sound foundation for further progress and development.

Since the training aim of young athletes is to prepare for the best possible performances when they reach the adult age, the correct approach to training during the years of growth appears to be most important to secure future success. In particular, it is absolutely essential that coaches are aware of the pitfalls of early specialisation, which, by its very nature, treats children as little adults (ARENS, D., 1983; ARENS, O., 1983; JONES, 1993).

Studies conducted by LOKTYEVIN & MAKAROVA (1993) revealed that many young athletes failed to lift their performances to an improved level after suffering from extreme competition loads. This was particularly noticeable among the talented youngsters who often decided to retire after a couple of seasons of exhaustive racing. These authors arrived at the conclusion that competitions at a young age should not be rigorous and harsh tests, but only special occasions to enjoy movement without extreme emphasis on winning. Keeping sporting activities fun and varied when young is essential, the hard specific training starts when the athlete is fully matured and that time can vary immensely from child to child (LOWES, 2005). MARKUS (1976) is also of the opinion that the age between 13 and 18

should be used to learn new skills and to have fun. He foresees serious problems should intensive, specialised training be introduced during the 12-16 age period.

According to MCSTRAVICK (1990), the following points should be borne in mind when considering both the content and the strategy of athletics coaching with school-age children:

- An enjoyable experience for participants must be provided
- A programme must be provided
- Programming must be geared towards success
- Play must be an important element of the activities

It is vital that competition for school age children be arranged so that all pupils have a positive experience. Late developers must not be placed in a situation where early developers will so dominate the competition that it becomes an unpleasant experience. MCSTRAVICK recommends group/team competitions and combined event competitions (where performance is related to score) because they provide excellent opportunities to stress self-improvement rather than winning and losing.

As far as the structure of the training progress of young athletes is concerned, JURISMA (1980) proposes to divide training into the following four stages:

1) Play training (7-10 years)
2) Basic training (11-13 years)
3) Constructive training (14-16 years)
4) Specific training (from 17 years)

According to THUMM (1982 and 1987), long-term training with children and youths should be structured as follows:

- 9-14 yrs.: Basic training, aiming to develop general movement awareness in several sports and to learn the rough structure of techniques in all track and field events.
- 15-19 yrs.: Build-up training, aiming for a gradual development of a specific individual competitive event or specialisation in multiple events (decathlon, heptathlon).
- 20 yrs.: High-performance training, aiming to fully exploit the athlete's physical and psychological potential.

Strength training

The pros and cons of strength training for children and adolescents have been a very discussed topic in recent years. For a long time physicians and physiologists were convinced that weight training did not produce significant strength gains in prepubescents (DUDA, 1986). Insufficient circulating androgens in children were considered as the predominant restriction to strength gains. Additionally, safety concerns regarding bone integrity, epiphyseal continuity and risk of injury have been common. However, recent investigations overwhelmingly support significant strength gains in prepubescents as a result of weight training. Further, based on recent findings of short-term prepubertal weight training, no damage to bone, epiphyses, growth tissue, or muscle has been reported (JACOBSON & KULLING, 1989). The risk of injury also appears low during participation in a resistance training programme, and this risk is minimised with proper supervision and instruction. Furthermore, with the incidence of injury in youth sports, a resistance training programme may provide a protective advantage in one's preparation for sports participation (KRAEMER et al., 1989).

However, according to KRAEMER et al., resistance training prescription in younger populations requires certain programme variables to be altered from adult perspectives. Individualisation is vital, as the rate of physiological maturation has an impact on the adaptations that occur. The major difference in programmes for children is the use of lighter loads (i.e. > 6 RM loads). It appears that longer duration programmes (i.e. 10-20 weeks) are better for observing training adaptations. This may be due to the fact that it takes more exercise to stimulate adaptational mechanisms related to strength performance beyond that of normal growth rates.

The Guidelines of the National Strength and Conditioning Association (NSCA) on the

organisation of strength training for young athletes (FAIGENBAUM et al., 1996) are as follows (excerpt):

1) The exercise session should include 5-10 minutes of warm-up and cool-down exercises (e. g. low-intensity aerobic exercise and stretching).
2) Training should be started with 1 set and 6-8 body-part exercises. At the beginning relatively light loads (12-15 RM) should be used to allow for appropriate adjustments to be made.
3) The resistance should be gradually increased as strength improves. A 5-10% increase in overall load is appropriate for most children.
4) Progression may also be achieved by gradually increasing the number of sets, exercises, and training sessions per week (i. e. training volume). As a general guideline, 1-3 sets of 6-15 repetitions of 8-10 exercises performed on 2-3 non-consecutive days per week are recommended.
5) Following 6-8 weeks of general resistance training, specific multi-joint structural exercises (bench press, squat, leg press) may be introduced into the programme based on individual needs and competencies. New exercises should be started with a relatively light weight (or even a broomstick) to focus on learning the correct technique while minimising muscle soreness.
6) Following several months of resistance training, advanced multi-joint structural exercises (e. g. Olympic lifts and modified cleans, pulls, and presses) may be incorporated into the programme provided that appropriate loads are used and the focus remains on proper form. The purpose of teaching advanced multi-joint lifts to children should be to develop neuromuscular coordination and skill technique. Explosive movements with heavy resistance should be avoided during prepubescence but may be introduced with caution during adolescence.
7) The concept of periodisation should be incorporated into a child's training programme by systematically varying the resistance training throughout the year.

The dropout problem

Young athletes must not only be identified and developed but they must also be retained. For example, in the USA 35% of the participants in children's sports programmes withdraw each year. While some move to other sports, others drop out altogether (RIEWALD, 2003). The prevention of dropout is therefore also an important task of athletics organisations.

BUSSMANN (1999) defines dropouts as those athletes who have terminated their athletic career prematurely, i. e. before they have reached their top performance. She identifies the following factors as decisive for the termination of one's career – and vice versa – for continuing one's competitive career: stresses and strains at school and work, injuries, missing free time, conflicts in the athletic environment: with coaches, club, the training group and officials, lack of support by the family, missing or inadequate motivation, low social mobility, a critical attitude toward competitive sport. In her view, the risk of dropout can be minimised by:

1) including the conditions outside sport (such as school and job/professional education) in the planning of the individual career,
2) supporting the athlete in the process of overcoming an injury,
3) discussing and solving conflicts between the competitive sport activity and leisure-time activities,
4) a socially supportive and harmonious climate in the club and training group,
5) ensuring that the athlete is supported by his or her familiy,
6) ensuring that the athlete's coaches have a basic knowledge of performance motivation in general and of their respective athlete's motivation in particular, and
7) supporting the athlete's social mobility and attitude toward competitive sport.

LEE & OWEN (1984) point out that dropout can also be reduced by promoting fun and intrinsic interest as well as setting individual goals.

RIEWALD (2003) places particular emphasis on the fun factor and lists the following strategies to incorporate fun into the youth athletics environment:

1) Bring more relays to youth athletics.
2) Structure multidiscipline competitions, i. e. each athlete competes in a throwing, jumping and running event.
3) Allow for or create opportunities to interact with friends.
4) As a coach, know the athletes as people.
5) Communicate/provide feedback to each athlete on a regular basis.
6) Be creative with scoring so that many experience the positive feelings of success.

The incorporation of 'fun' in athletics means that athletics for children must be modified (FREY, 1992). A proportionate athletics programme for students should be many-sided and supported by motivational psychology. The training volume, training frequency and the number of competitions should not be simply a scaled down copy of training programmes for adults. A variety of different situations makes participation in athletics more attractive and can therefore reduce the number of dropouts.

The British concept of Fun in Athletics has been made particularly attractive by moving the competitions, which take place in autumn, winter and spring, to indoor settings. This makes it possible to provide a different environment for the novel events, conducted as a team competition. Emphasis is placed on a team effort, creating a need for all team members to play their part, even when they have to line up for events that are not among their favourites. This approach assists in avoiding early specialisation. Although certain competition rules are applied to the fun events, disqualifications are avoided as far as possible in order to have all performances acknowledged. The four event groups are made up from the following:

1) Running (shuttle runs, relays),
2) Jumping (standing long jump, speed bounce, vertical jump, triple hop, scissors high jump),
3) Throwing (sitting medicine ball put, standing javelin throw),
4) Grand Prix (all team members take part, the start takes place similarly to Formula 1 Grand Prix in motor racing, the athletes have to navigate first the under and over tunnel before moving to other equipments which can be placed in any random order to provide a parcours type of circuit) (BUSSE et al., 1998).

In the spring of 2001, an IAAF working group developed an event concept for children, henceforth labelled IAAF KIDS' Athletics, which like Fun in Athletics is a distinct departure from the adult model of athletics. In 2005, the IAAF created a global athletics policy for youth from 7 to 15 years old. This policy has two objectives: 1) to make athletics the most practiced individual event in schools in the whole world; 2) to enable children to prepare for their future in athletics in the most efficient way. The approach hinges on forms of competitions that are appropriate to all age categories and to the institutions that implement this programme. These competitions are the organising structures for the children's practice of athletics – training of athletes, education of coaches, judges, etc. IAAF KIDS' Athletics is intended to bring excitement into playing athletics. New events and innovative organisation will enable children to discover basic activities: sprinting, endurance running, jumping, throwing/putting in just about any place. The athletics games will provide children with the opportunity to make the most of the beneficial practice of athletics, in terms of health, education, and self-fulfilment (GOZZOLI et al., 2006).

International competitions for young athletes

On the international level the most important athletics championships for young athletes include:

- the IAAF World Junior Championships for Athletics (for athletes of 18 or 19 years on 31st December in the year of competition, held biennially since 1986),
- the IAAF World Youth Championships in Athletics (for competitors who are 17 or younger, held biennially since 1999),

- the European Athletics Junior Championships (first held in 1970, held biennially since 1973),
- the European Athletics U23 Championships (for athletes under 23 years of age, held biennially since 1997).

The introduction of international championships for young athletes has not met with unanimous agreement. For example, in a roundtable discussion dealing with the 1st World Youth Championships (CHIMIER et al., 2000), it was pointed out that the main danger for the IAAF in staging the WYC is that some coaches might start to specialise their athletes in just one event or their training might focus on the improvement of performance at all costs in order to get good results in the championships. This could lead to many problems, which could hinder the development of the athletes in the future. It was recommended that the IAAF limit the age of the athlete to 16-17 and that athletes who are younger should not be allowed to enter the championships.

This aspect of international championships for young athletes is also taken up in a very interesting article by BAUMANN & MALLOW (1998). In their analysis of the performance situation in German junior middle- and long-distance running, they conclude that in Germany junior middle- and long-distance runners train extremely hard without, however, exhibiting correspondingly improved performances in their senior years. The cause of this is, besides a too early concentration on running training and the neglect of under- and over-distance competitions and cross country races, the fact that today's ambitious juniors all aim to take part in the European and World Junior Championships. In the seventies and eighties, when German distance runners were more successful, world junior championships did not exist, cross-country racing used to be regarded as a must for middle-distance runners, and a wide approach to performance development meant racing in over- and under-distance competitions. Fartlek used to be very popular among German distance runners, who trained a lot on undulating cross country trails. This promoted the natural development of the important factor of strength endurance. In general, the early training years of German elite distance runners were characterised by a refreshing simplicity. They learned how to guide themselves and how to deal flexibly with the training plan. Because of this naturalness, combined with spontaneity, training was an uncomplicated and therefore enjoyable activity.

The rather negative view of the effect of international competitions for the younger athletes on German distance running is not shared by SCHOLZ (2006), who conducted an analysis of the throwing events at the IAAF World Junior Championships. He arrives at the conclusion that the championships are a springboard for entry into the elite class. He even states that for the future it can be assumed that athletes without international experiences in the Junior category will be successful in big events (e. g. in Olympic Games, World Championships, World Indoor Championships, etc.) only in exceptional cases. Experiences as well as statistics confirm that for the "young stars" the World Junior Championships are an important step. However, winning a title at this level is no guarantee for victory at the very highest level senior events.

The results of a study of the performance development of the finalists at the 1999 IAAF World Youth Championships conducted by GRUND & RITZDORF (2006) are comparable to Scholz's. They found, among other things, that 90% of the finalists (n= 266) at the first WYC continued to improve in the subsequent years and 88% made the world top 100 in their best disciplines. They conclude that as 21% of the group qualified for the IAAF World Championships in Athletics and/or the Olympic Games between 2000 and 2004, there is no basis on this point for rejecting international youth championships as a valuable element of the world competition calendar.

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