Human Growth and Development: Implications For Coaches

Level One Coaching Course

Australian Track and Field Coaches Association

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This paper provides coaches with information and implications regarding exercise prescription for children which was taken from the American College of Sports Medicine (ACSM) Resource Manual (1998) Chapter 60. Suggested guidelines include information based on scientific evidence and expert opinion. It should be noted that data on pre-adolescents are limited due to experimental procedures not appropriate for use with children.

Terms used have been taken from the ACSM manual and include the following:
Childhood is defined as the period that includes pre-adolescence and adolescence, ending with adulthood.
Adolescence is defined as ages 11 to 21 years (There is substantial variability in growth status and maturity level for any given chronological age. This makes the distinction between pre-adolescence and adolescence imprecise.)

The paper has attempted to mainly focus on pre-adolescents for the reasons associated with the target coaching emphasis of the Level 1 coaching qualification. However, exercise prescription guidelines for the adolescent have also been included. Coaches interested in more information regarding the older athlete should refer to the ACSM manual.

Physiological Aspects
Physiology of the pre-pubescent child is similar to that of the pre-adolescent. The precise physiological response of children going through puberty, therefore, depends on growth and biological maturation.

The literature tells us that it is important to keep children "naturally active." There is no evidence that increasing levels of physical activity will speed up maturity or have adverse effects to growth.
When coaching adolescents, we should keep in mind that they are not necessarily "little adults." This is due to some of the major differences between pre-adolescents and adults in regard to their physiological responses to exercise. Table 1 shows some of the more relevant differences in regard to cardiovascular (heart and blood-stream), metabolic (energy system), pulmonary (lung function) and thermo-regulatory (temperature control) factors.
Important points to make special note include:

- Pre-adolescents are not able to perform *intense* anaerobic tasks (10-90 seconds) anywhere near as well as adults
- Children can perform endurance exercises quite well, but fatigue more easily in prolonged high-intensity tasks
- Children are well suited to intermittent activities (these activities are more likely to be perceived as 'fun' especially with the immediate peers involved)
- Children appear to rely more on aerobic metabolism to meet energy demands
- Coaches should be aware of the increased risk of stress for children when exercising in extreme climatic conditions
- When children exercise in prolonged activities they should drink water well before and coaches should insist on fluid intake during activity
- There is substantial risk of injury to children in *hot and humid* conditions due to their reduced capacity to evaporate sweat.

Table 1. Physiologic Characteristics of the Exercising Child

Function	Comparison to Adults	Implications for Exercise
$VO_{2\,max}$	Similar	Children can perform endurance tasks quite well.
Submaximal oxygen Demand (economy)	Higher metabolic cost.	Greater fatiguability in prolonged high-intensity tasks (running, walking). Greater heat production in children at a Given speed of walking or running.
Anaerobic (Glycogen stores)	Lower concentration and rate of utilization of muscle glycogen.	Similar to adult levels by about age 16. Less talented pre about 16 years.
Anaerobic ability	Glycolysis limited because of low level of phosophofructokinase.	Ability of pre-adolescent children to perform *intense* anaerobic tasks (10-90s) is distinctly lower than adults.
Max. cardiac output	Lower due to size difference.	Children are limited in ability to transport core heat to surface for dissipation during intense exercise in heat.
Maximum stroke volume	Lower due to size and volume.	No implication other than lower $VO_{2\,max}$
Maximum heart rate	Higher	Up to maturity HR_{max} between 195-215 b/m.
Oxygen carrying capacity	Blood volume and total hemoglobin are lower in children.	Lower aerobic capability.
Systolic/diastolic pressure	Lower maximal and submaximal.	No known beneficial or detrimental effects on working capacity of child.
Rating of perceived exertion	Exercising at a given physiologic strain is perceived as easier by children.	Implications for initial phase of heat acclimatization.
Surface area (SA)	Per unit mass, approx. 36% greater in children.	Greater rate of heat exchange between skin and environment. In climatic extremes, are at increased risk of stress.
Sweating rate	Lower absolute amount per unit of SA. Greater increase in core temp required to start sweating.	Greater risk of heat-related illness on hot, humid days due to reduced capacity to evaporate sweat; lower tolerance time in extreme heat.
Body cooling in water	Faster cooling due to SA per heat-producing unit mass; lower thickness subcutaneous fat.	Potential hypothermia
Body core heating during Dehydration	Greater	Prolonged activity; hydrate well before and force fluid intake during activity.

Adapted from Zwiren LD & Manos TM, Exercising testing and prescription considerations throughout childhood. In: ACSM Resource Manual for Guidelines for Testing and Prescription (Chapter 60 pg. 507-508.) 3rd ed. Williams & Wilkins: Maryland.

Bone Mass Considerations

Adolescence is a critical time for bone density/strength maximization and the consensus supports the inclusion of physical activity and exercise (especially weight bearing) That is, short bouts of intense daily activity and resistance training. (Note: also include adequate nutrition with calories/calcium, and appropriate hormonal status.)

As amenorrhea (no period) can have severe consequences on bone mass density for adolescents, it is important for coaches to monitor menstrual status. Post-pubescent females should be encouraged to participate in activities of all intensities.

Coaching in Climatic Extremes

Pre-adolescents are more likely to suffer from heat-exhaustion while adolescents will suffer from heat-stroke when competing/training in stressful hot climates.

Pre-adolescents produce excessive body heat (due to higher energy expenditure), have a poor sweating capacity, a large surface-to-mass ratio, and less advanced cardiovascular system. This will cause them to (a) have less tolerance for exercising in heat, and (b) greater susceptibility to heat stress. Therefore, care must be taken in the heat. Consider the scheduling of early morning endurance events to avoid hotter temperatures that occur later in the day. As heat related disorders are more prevalent in events that exceed 30 minutes in duration, this time should be reduced whenever relative air humidity and temperature are high (>25C with >70% relative humidity).

To avoid dehydration, water must be available and is strongly recommended before children become thirsty. Fluid should be replaced at a rate of 100-150 ml every 15-30 minutes while participating in continuous activities more than 30 minutes. Sugar and mineral supplements in the fluid should be kept low (25g/l sugar, 0.3g/l salt). Certainly not strong/concentrated sport supplement drinks and it is probably better to just use water. There is no evidence to support sports drinks have any benefit over water for children.

The American Academy of Pediatrics recommends the wearing of light weight clothing (one layer of absorbent material), to expose skin, and help sweat evaporation. Also, wet clothes should preferably be replaced by dry clothes to allow sweat evaporation. At no stage should children be made to use tracksuits or heavy clothing to increase temperature in order to lose body weight by sweating.

Overuse Injuries for Children

These types of injuries are caused by repetitive microtrauma to the muscles and bones. Most injuries for children are preventable by carefully monitoring growth rate (particularly during periods of accelerated growth; the most vulnerable time) and fatigue states. Signals such as pain and admitted fatigue should also be monitored. Some of the risk factors for overuse injury include the following:

- Improper footwear
- Inflexibility
- Large changes in exercise intensity, volume, frequency, type of training
- Imbalance of muscle strength and flexibility around joints
- Training on hard surfaces
- Excessive loading of the back and knees during growth spurts
- Incorrect biomechanics

Finally, at this stage there are no data to support precluding children from distance running

Exercise Prescription

All adolescents should be encouraged to engage in daily physical activity such as games, play, sport, work, transport (riding bike), recreation, physical education,, or planned exercise. Contexts should include family, school, clubs, and community activities. It is suggested that adolescents should engage in three or more sessions each week of activities that last 20 minutes or more at a time and that require moderate to vigorous levels of exertion.

Some of the main aims for coaching pre-adolescents are (a) maintain activity, (b) enjoy exercise and movement, and (c) develop positive attitudes to physical activity for the future. So to accomplish these aims with pre-adolescents, coaches should:

- Allow children to be naturally active
- Allow them to control their own intensity and duration of activities
- Make activities fun for enjoyment
- Encourage outside play (away from computers, TV etc..)
- Involve activities to gain basic motor and sport skill competency
- Provide active role models

In relation to strength training, it is generally regarded that the benefits of participation for children, outweigh any risks with supervision by a well-trained coach. Some risks to consider when training children:

- low back injury
- growth plate injury with adolescents
- hypertension and possible 'weight lifter's blackout'

Suggestions for coaches regarding safety during strength training:

- close, continuous, trained supervision
- adequate warm-up
- high repetitions per set (6-8) to ensure weight is not too heavy
- adequate recovery between sets and between days (only 2-3 days per week)
- emphasis on technique by initially teaching good form with no resistance
- inclusion of flexibility exercises
- inclusion of body weight as a resistance
- overload initially by increasing number of repetitions
- do not expect visible muscle development with pre-pubescent adolescents

In summary, strength gains can be gained with minimum risk of injury to pre-pubescent and pubescent children. Be aware that training induced strength gains are quickly lost during detraining. Pre-adolescents gain strength but relatively smaller gains compared to adolescents, particularly pubescent adolescents.

Major reference:

American College of Sports Medicine. (1998). *Resource Manual for Guidelines for Exercise Testing and Prescription* (3rd ed.). Baltimore, Maryland: Williams & Wilkins.

Code Of Ethics For Coaches

The coach's primary role is to facilitate the process of individual development through achievement of Athletic potential. This role accepts the athletes' long term interests as of greater importance than short term athletic considerations. To fulfil this role the coach must behave in an ethical manner respecting the following points:

- Coaches must respect the basic human rights, that is the equal rights, of each athlete with no discrimination on the grounds of sex, race, colour, language, religion, political or other opinion, national or social origin, association with a national minority, birth or other status.

- Coaches must respect the dignity and recognize the contribution of each individual. They must ensure that the practical environments are safe and appropriate. This appropriateness must take into consideration the age, maturity and skill level of the athlete. This is particularly important in the case of younger or less developed athletes.

- Coaches must acknowledge and respect the Rules of Competition. This respect should extend to the spirit as well as to the letter of the rules, in both training and competition, to ensure fairness of competitive opportunity between all athletes.

- Coaches must exhibit an active respect for officials, by accepting the role of the officials in providing judgment to ensure that competitions are conducted fairly and according to the established rules.

- Coaches must accept final responsibility for the performance and conduct of the athletes they coach, while at the same time encouraging the independence and self determination of each athlete by their acceptance of responsibility for their own decisions, conduct and performance.

- Coaches must assert a positive and active leadership role to prevent any use of prohibited drugs or other disallowed performance enhancing substances or practices. This leadership by coaches includes education of the athletes of the harmful effects of prohibited substances and practices.

- The coach must acknowledge that all coaches have an equal right to desire the success of the athletes they coach - competing within the rules. Observations, recommendations and criticism should be directed to the appropriate person outside the view or hearing of the public domain.

- Coaches should never solicit, either overtly or covertly, athletes who are receiving coaching to join their squad.

- Coaches should hold recognized coaching qualifications. Coaches should respect that the gaining of coaching qualifications is an ongoing commitment, achieved through the upgrading of their knowledge by attendance at accredited courses and through practical coaching experience.

- Coaches should enter into full co-operation with all individuals and agencies that could play a role in the development of the athletes they coach. Coaches also have a responsibility to share the knowledge and practical experience they gain.

- Coaches should work openly with other coaches, use the expertise of sports scientists and sports physicians, and display an active support of their National Federation and the IAAF.

- Coaches must respect the image of the coach and continuously maintain the highest standards of personal conduct, reflected in both the manner of appearance and behaviour.

- Coaches should never smoke while coaching, nor consume alcohol beverages so soon before coaching that it affects their competence or that the smell of alcohol is on their breath.

Adopted by AT&FCA from IAAF Code of Ethics 27.2.97.

THE PROCESS OF TECHNICAL COACHING IN TRACK AND FIELD???

A COACH SHOULD -

HAVE A MODEL OF PERFORMANCE - Based on a clear CONCEPTUAL, visual, verbal and, ideally a kinesthetic picture of the event.

THE PROBLEM - Specific variations in technique - SHOT spin/ glide , long short, short long, block or lift . Individual variations because of different physical characteristics - the barrel javelin thrower and the bean pole.

BE ABLE TO 'SEE' WHAT IS HAPPENING.
- This implies knowing what to look for, knowing how to best position oneself to see what you want to see, observing the RESULT of the performance (distance, angle of release, flight path, the spin of an implement, landing spot etc.) and MOST IMPORTANTLY watching several / many attempts before coming to any specific conclusions.

THE PROBLEM - It may require the use of video equipment and the use of objective data timing and measuring devices, force platforms, lactate analysis. It should usually involve some discussion with the athlete about how / what they felt about the performance.

COMPARE WHAT THEY 'SEE' WITH THEIR 'MODEL' OF PERFORMANCE.

IDENTIFY THE DIFFERENCES BETWEEN THE MODEL AND THE PICTURE.
- Remembering individual differences

DECIDE ON THE CAUSE (S) OF THE DIFFERENCES.
- Consider Strength, Power, flexibility, skill, speed. Bear in mind where the athlete is in their athletic development.

DETERMINE COACHING PRIORITIES
- in relation to short term and longer term goals. What should the coach focus on first? What changes will produce the best performance? How long will change take? Is the athlete 'ready' to change? What conditioning is required, what drills can be used? "The pole vault begins with the first step" PETROV.

ESTABLISH COACHING PLAN
- in relation to goals

ENSURE TRANSFER OF NEW TECHNIQUE INTO THE COMPETITIVE SITUATION

ARRANGE COMPETITION

DEAL WITH PROBLEMS OF REGRESSION - 'FAILURE'

BEGIN AGAIN

THE PROCESSES OF COACHING TRACK AND FIELD

Traditional approaches to coach education in most sports, including track and field, have been based upon a theoretical grounding in sports science and have ignored the fundamental processes which make up the 'craft' of coaching. This has left many beginning coaches sadly unprepared for the realities of this complex role and may be a major reason for the high drop out rate of coaches after they have completed Level 1.

Following discussion and debate at the successful Congress held in Canberra in 1996, the Australian Track and Field Coaches Association resolved to make the practice or 'craft' of coaching the central theme in our coach education program. In this way we hope to make better use of the time available, to give coaches the skills they really need to function as a practising coach as well as the capacity to continue to grow in this difficult role

Many vocations and professions, including coaching, are essentially practical in nature and involve continual decision making and good interpersonal interaction. They are about doing, about applying knowledge in real life situations and not merely about 'knowing'. Practitioners are often faced with ongoing complex situations where they must respond instaneously and effectively in both a professional and a personal way to best help their client. They work in what Donald Schon calls the "complex, unstable, uncertain, conflictual worlds of practice" where there is little time to make the perfect 'theoretical' response.

This is not to say there is no place for theoretical knowledge, for without a sound grounding in sports science it is difficult for a coach to prepare effective training programs, to 'reflect' on their coaching i.e. to critically analyse what they are doing, or to take on new ideas. However instead of bombarding the prospective coach with large chunks of often unrelated theory, we will present important theoretical knowledge at the most significant time during the practical work so that coaches can see the relevance of theory to practical coaching.

SCHON further clarifies this issue by introducing the concepts of 'knowing, 'knowing in action ' and 'knowing in reflection'. 'Knowing' is simply having the theoretical knowledge about a subject or an activity while 'knowing in action' implies that an individuals 'knowing' is reflected only in what they 'do', for their actions are not driven by conscious thought. They simply do something and it is intuitively the right thing to do - or it is not! Thus if they are asked why they did what they did they may be unable to provide any rational answer other than "it just seemed the right thing to do at the time". The 'knowing' of many sportsmen falls into this category but so to does the behaviour of professionals in many fields; the effective 'bedside manner' of the good doctor is an example of knowing in action. The major advantage of 'knowing in action' is that intuitive behaviour is instantaneous and natural and so highly effective.

Both 'knowing' and 'knowing in action' have their limitations. As has been suggested above, coaching is essentially a doing activity where pure knowledge has little value unless it is applied to the task of helping athletes achieve their

potential. We have all met the academic who knows everything about a topic but cannot manage the complex interactions necessary to survive in a classroom and so cannot even begin to teach what they know.

On the other hand 'knowing in action' is limited simply because few individuals can do the right thing intuitively all, or even most of the time.
When mistakes occur, or when circumstances change, the 'doer' often lacks the conceptual base to analyse what happened and to make necessary changes. This may mean that they remain locked into a restricted range of behaviour and are unable to take on new ideas or function effectively in differing environments. Also because their behaviour is intuitive it is difficult for them to explain it to others and so pass on the secrets of their success.

SCHON'S concept of 'reflection in action' may provide the key for coaches to develop their full potential. When individuals work within a conceptual framework and develop the ability to stand back and objectively assess their behaviour, to reflect on the their actions, they can begin to modify what they do on a continuous and ongoing basis. This means that they can deal with new situations flexibly and, most importantly in the context of our new coach education program, they are better able to explain why what they do is effective.

To make the complex craft of coaching more intelligible for beginning coaches and to help experienced coaches become more reflective in what they do, we have identified and articulated a series of 'coaching processes', each of which encapsulates an aspect of the coaches role.

In section 1 we put forward the notion that COACHING IS CONTEXTUAL.
The importance of each process will therefore vary from one coach to the next. For example some coaches may operate in a situation in which TALENT IDENTIFICATION or RECRUITING are virtually irrelevant or where ADMINISTRATION is not especially important. However circumstances change and coaches may find that some aspects of the coaches role which seem unimportant at one stage in their career become vitally important at another.

Since this approach to analysing the task of coaching is relatively new, the material presented is not definitive but rather an outline which will be filled in as practical coaches provide the author with the detailed feedback necessary to flesh out each element of the coaching task.

In many cases a vast amount of material is already available so each section will have a series of readings and references to further amplify the issues involved. The readings make up the core of the work while the references will provide interested candidates with supplementary information they may wish to acquire. In practice this means that at Level One, candidates will have to show evidence that they have studied the readings indicated, while candidates who hope to progress to Level Two will have to demonstrate that they have pursued at least one special interest area by obtaining the reference material suggested and by beginning to develop a file of related articles.

TALENT IDENTIFICATION

The classical model of talent identification and sport development is usually represented as a pyramid with a broad base which gradually tapers to a peak. Conventional wisdom further holds that the broader the base the higher will be the peak. Unfortunately the model for track and field in Australia looks more like a drawing pin than a pyramid for we have a broad but thin base which rapidly turns into a very narrow column which in turn has a short sharp point. (Diagram)

The base represents all of the children who are exposed to the sport at school, the column the relatively small numbers attracted into our sport as 'athletes' and the sharp point the tiny number who achieve international standards. In fact some events such as the pole vault or the hammer, which are rarely taught in schools, are best represented by a needle standing on its point because there are more elite athletes than beginners in schools!

This has enormous implications for our sport and suggests that coaches must make RECRUITING a major priority - with or without a formal talent identification program.

Clearly there are many coaches, including some who have been very successful, who do not employ any formal talent identification procedures. They simply take on every athlete who shows up and do the best they can for them with the view that if the athlete shows potential and develops quickly well and good, if they do not, nothing has been lost. This reflects a coaching philosophy which is very common among Australian coaches and is clearly appropriate for those working with Little Athletes.

However not every coach enjoys the luxury of being able to give their time and energy in this way. For example our small cadre of professional coaches, who are expected to produce international calibre athletes, cannot afford to give the time to 'recreational' athletes or those with limited talent.

Some 'amateur' coaches, who work best with individuals and small groups or who have limited time to give, may also need to maximise the value of their commitment by working only with athletes who have the potential to achieve high standards. In fact given the time and energy required by both athlete and coach, it makes sense to have some way of identifying the potential of the former, so talent identification is not merely a process of accepting or rejecting athletes. It is also a way of ensuring that athletes can quickly find the area of the sport where they are most likely to be successful because, particularly in the Australian sporting scene, youngsters are far more likely to stay in the sport if they feel they are progressing.

Most coaches even if unconsciously, use a talent identification process, and, again often unconsciously, send messages to young athletes that they should try another event or even another sport!

The talent identification process is fraught with difficulty because no matter how scientific the methods used, there will always be youngsters whose will to succeed will overcome their apparent physical limitations.

Conversely every experienced coach can name dozens of great physical talents who lacked the desire, concentration or focus to make the necessary commitment.

Another critical issue is that of physical age compared with chronological age. Many apparently talented thirteen and fourteen year old athletes are successful simply because they are physically precocious i.e. they are physically large for their age. When they lose that size advantage over their peers, as often happens over the next two to three years, their superiority vanishes.

If all the schools of Australia had rational physical education curricula instead of the 'mile wide, inch thick' programs currently in favour, talent ID programs would not be necessary because children would get sufficient exposure to ATHLETICS to identify their talent for themselves. Since this is rarely the case, it behoves clubs as well as individual coaches to at least attend many school and interschool sports days to try to spot talented youngsters. While scanning results sheets can be a simple and rewarding exercise, the talent of many youngsters is hidden, simply because many have had no effective teaching in the events they are competing in. The coach must go 'diamond hunting', hoping to find a gem among the many rough stones on show.

The simplest method of identifying potential talent is 'eye balling'. That means simply watching children run, jump and throw and assessing their size, shape, power, explosiveness, spring, movement qualities, rhythm, balance and their competitive spirit. Experience is invaluable here because most youngsters are very raw, and it often takes considerable insight to see the potential diamond inside the rough stone. Here it may be worth noting that there is huge diamond on display in the Topkapi Palace in Istanbul called the 'Three spoons diamond' because it was traded by its original finder, who clearly did not appreciate its value, for three wooden spoons. So the task of identifying diamonds is not always easy even in the real world. Reference Number One gives an indication of one coaches salutary experiences in this difficult area.

Formal talent identification programs have some advantages in that they have a built in credibility with parents which can help significantly with the next process, namely RECRUITING. However it is interesting to note that when a recent talent search program was run by the South Australian Sports Institute, one school did not even nominate for initial testing a girl who has subsequently won eleven national junior championships in the pole vault and was ranked second in her age group in the world in 1995! She came into the sport merely because her family were close friends of a pole vault coach.

In general formal talent ID programs involve -
- a speed test over thirty or forty metres, preferably with electronic timing
- a vertical jumping test
- a horizontal jumping test
- a basic power test such as the overhead shot throw
- a specific javelin test such as the 200 gram ball throw
- an endurance test of some kind or other.

Because of its importance of the physical v chronological age factor there is often an attempt to assess it through a subjective analysis of specific adolescent growth characteristics.

THE RECRUITING PROCESS

RECRUITING, that is bringing participants, especially youngsters, into the sport, is very much a function of the CONTEXT within which the coach operates. In some coaching contexts RECRUITING may be a non issue, for example with Little Athletics where parents are only too happy to take their children to what they see as a positive sporting experience.

Here it may be worth addressing the issue of the limited flow on from Little Athletics to the senior sport. because on the surface it would appear that the former should act as a natural feeder system to the latter, which is clearly not the case in many if not all states.

As always the issues are complex. Often the situation is seen to be a reluctance of either group to cooperate with the other. Indeed there have been occasions when Little Athletics Associations do not cooperate with the senior body because they claim that they represent 'family fun and fitness' not the sport of athletics, this despite being funded as the sport of athletics and despite running their State Championships as a mini track and field Olympics. They then argue that since they are not really involved in "Athletics" they have no obligation to ensure that their participants move on to the senior sport. Of course there is always another side to that story!

In fact the reasons why many, if not most, Little Athletes do not go on to the senior sport. In the first case many have had enough of athletics by the time they are eleven or twelve and perhaps have decided, wrongly in many cases, that they have no talent and no future in it anyway. They are also becoming less dependent on their parents and less enthusiastic about being with them; their peers are becoming more important in their lives and play a decisive role in deciding what is important. Parents who happily took their budding champions off to practice and competition but who now see the Olympic dream fading, become less willing to do so, especially when they have to make a much longer trip to the athletics stadium instead of the local oval.

Since the youngster is still not old enough to drive, even if a car is available, they find themselves trapped in needing their parents to transport them but with neither side overly enthusiastic about the situation. In fact in many cases where both parents work, neither is available during the crucial period immediately after school when it is most convenient for young athletes to train. All of these factors interact in a way which often means that even a talented and enthusiastic boy or girl cannot become an 'athlete'.

Some coaches establish local or even national reputations for excellence and so do not have to bother with recruiting. Athletes, even of international calibre,

gravitate to them even when it involves both relocation and dislocation. In these cases the biggest problem the coach has is in deciding whom to accept!

Of course there are areas of Australia where school sport still flourishes and where Athletics is seen to be important, even if only to bring greater glory to the school. As a result there may be steady stream of young athletes wishing to join clubs and find coaches, who need only wait for them to turn up. However in other situations recruiting may be a very difficult and prolonged process. This where the notion of the CONTEXT OF COACHING has considerable value because it enables a coach to logically analyse the CONTEXT they are in, to develop strategies which minimise the disadvantages and maximise the advantages of their situation.

The predominant socio/economic/ethnic status of an area or even of a specific family may be a major limiting factor in a childs participation in athletics. Some families or even communities simply do not value participation in any sport, especially one which promises limited, if any, financial rewards. Many girls from ethnic backgrounds find it particularly difficult to become athletes because of community values which, ironically, are no longer held in the 'old' country. Even in the broader Australian community there is a perception that some events such as the pole vault are inherently dangerous for girls or that the throwing events are not 'lady like' so even very talented youngsters may be discouraged from taking them up.

However perhaps the most significant factor which prevents many younsters becoming 'athletes' is their commitment to other sports. Almost invariably the talented young athlete will be promising in a range of sports, sports which unfortunately for us often have a far higher profile than track and field and which provide greater glory for less effort. Here it is important for track and field coaches to understand that living in a sports mad country has its disadvantages.

This is because, while Little Athletics flourishes, the fact is that experienced coaches, along with most experts in child development, do not believe children should make a serious commitment to a single sport until they are at least fifteen. They believe that children should pursue a broad based sporting life into their teenage years and only make a serious commitment when they have clearly established where their interests and talents truly lie. Unfortunately few other sports follow this perhaps idealistic notion and in fact are tending to push specialisation to lower and lower age groups. In the extreme case of gymnastics we find eight year old girls training for forty to fifty hours a week while many other sports such as basketball expect a year round commitment which makes participation in other activities difficult if not impossible from the age of twelve or thirteen.

Another major problem in Australia is that of geography and distance. In many States literally thousands of talented youngsters miss out because they live too far away from the limited number of suitable training venues in Australia. In fact it is fair to say that, despite our very high standards in the pole vault at junior levels, we are barely scratching the surface of the talent pool for this event simply because only very few children get to try it and of those that do, only a handful live near

be to try to reach agreement with each athlete you coach that it is in the best interests of the sport, and perhaps of an event - such as the pole vault or hammer, where there is rarely a rush to participate - if more athletes can be brought in. Unfortunately athletes have very short memories and even though they may have benefited from an 'open door' policy at the beginning of their career are not always keen to see others benefit in the same way if they feel that they may lose something in the process.

This is where a team approach to coaching can pay immense dividends because if two or more coaches work together, especially in a mentor and apprentice relationship, it is possible to ensure that beginners can be looked after without the more 'senior' athletes missing out.

THE EVALUATION PROCESS

While the initial talent identification process can give some idea of the basic physical qualities an athlete possesses, the coach must quickly begin to more carefully assess their strengths and weaknesses. As with a chain, an athlete is only as strong as their weakest link so that years of training can be wasted because of an injury to a tiny part of the body or a minute technical problem.

THE PLANNING PROCESS

The planning process can vary in length from a few days to many years.

THE INSTRUCTIONAL PROCESS

This is another process which is both simple in theory but highly complex in practice because it demands a 'seamless' interweaving of the professional skills which underpin good instruction with the interpersonal skills which encourage the learner to really want to learn. For coaches in many events it is THE critical process of coaching

The basic instructional model detailed below was developed through careful observation of what good teachers actually do to facilitate learning. However it is important to understand that this model also matches theoretical models of instruction based on an analysis of the way learners best acquire physical skills. Gentile

To help lay, i.e. non professional or novice, instructors quickly understand and assimilate the basic principles of instruction, a working model of this complex process called "The P's of Perfect Pedagogy" was developed in the School of Physical education at the University of South Australia during the late 1970's. This model is easy to comprehend in its totality and simple to execute in its individual elements. However as has been implied above, complete mastery will still elude many individuals after years of effort, such is the complexity of the teaching task.

enough to a facility where they can develop their talent. Contrast this with the situation in Basketball or Netball.

A third factor may be cost, for even in this day and age many families feel they cannot afford even the relatively small sums involved in joining a club, registering with the Association or buying specialist shoes and equipment. Certainly the cost of travel to National championships is becoming a burden to almost all families. Linked to this may be a need for an adolescent to have a part time job to help with family finances or simply to buy other important things like clothes, electronic equipment or even a car.

However as was suggested in the section on the 'context of coaching', probably the single most important factor is the nature of the sport itself. Success in Track and Field, perhaps more than most sports, depends on the middle class values of long term commitment, delayed gratification, effort will bring its rewards. Unfortunately in this day and age many young people, even those with great potential, are looking for the easy option and, most importantly prefer activities with a strong social element - where they can be with their friends.

The key to convincing parents that the effort and cost is worth it is an approach which combines a sensible sales pitch with evidence that the child has some talent for the sport.

An effective TALENT IDENTIFICATION program can have a major impact on recruiting. This is because it can CONFIRM THE TALENT of a child in an objective way and so provide the key to convincing parents that the effort and costs involved are worth it. This is another idea which has rarely if ever been articulated in the literature on Talent Identification

THE ASSIMILATION PROCESS

The issues involved in bringing a new athlete into a training squad have rarely if ever been dealt with. Many coaches establish strict limits on the size of their squad, both to ensure that they can give each athlete the attention they need and to retain their own sanity. A fortunate few are in a position to coach only one or two high level athletes

The interaction between members of a group can have an enormous impact upon the performance of individual members. Clearly where there is discord and antagonism the group will not be effective in achieving its aims and the task of the coach will become far more difficult. New members, particularly if they are talented may represent a threat to some established athletes, who may refuse to accept them or who make life difficult for them in any of a number of ways. While this may appear selfish, it is to some extent understandable because the more athletes a coach works with the less each athlete can be helped.

Some coaches use a democratic system where the original group members have some input into whether or not a new athlete should be invited or allowed to join. However this approach has some limitations and an alternative method may simply

THE TECHNICAL COACHING PROCESS

At its most basic level track and field is simply a series of physical tests, each of which poses a different challenge for the participant. However these tests, although remaining simple in concept, become ever more complex as the level of performance rises. While the vast gap between the working technique of a novice pole vaulter and the advanced technique of an Olympian is obvious, it is not always appreciated that there is a similar gap in technical complexity between a 'fast runner' and a world class sprinter.

At the beginning level all that matters is 'how fast', 'how far' and and 'how high' the young athlete can perform and technique is merely a means to an end. Thus the teacher, or the coach, introducing beginners to the sport need only teach a 'working model' of the event which basically conforms to the rules but which, most importantly, enables youngsters to begin 'testing' themselves as soon as possible.

When youngsters do decide to become 'athletes', coaches must help them begin the long process of moving from the initial working technique towards the more effective advanced technical model. While the former is constrained only by the rules and the need for youngsters to start 'competing' quickly, the latter is determined by fundamental biomechanical and aerodynamic principles which must be applied to achieve the best possible performance. The process through which the technique of an athlete is improved, is what we have termed 'TECHNICAL COACHING'.

Clearly the relative importance of TECHNICAL COACHING depends on the events a coach specialises in, although the point must be made that even in the long distance running events, technical ability in terms of an efficient running style is of vital importance. However the ability to ensure that athletes are technically efficient is clearly most important in the field events, the sprints and the hurdles, so coaches of these events must be a master of the process of technical coaching.

The first requirement is that a coach have a clear conceptual, theoretical, 'picture' or model of the event. This must be based upon a sound knowledge of the rules of the event and of the biomechanical principles which underpin successful performance. This issue is clouded because in some events, there are two or more alternative techniques which seem to meet the criteria above. In the shot put for example the coach can choose between the 'Glide' and the 'Spin, two completely different solutions to the problem of propelling a heavy ball a long way.