Module 1

Planning

Introduction

It is often said that planning training programmes is a combination of art and science. One of the most important aspects of sports performance is the athlete being in the best shape at the right time. This is the case not only for the elite athlete arriving at major games or championships, but also for the club athlete aiming for a special event. Athletes will always want to produce personal bests at the events that are most important to them, but to be able to do this the element of risk has to be removed by yearly planning.

Various systems of planning the athlete's year have developed over recent decades, most of which are formed around picking a key event much in advance and working towards such a goal. The event chosen will vary according to the athlete's standard. For the very best, this will indeed be a major championship. For those less confident, it may be the selection race for such a championship, while for those on the level below, it could be a county championships or even a club event. Once the main event is chosen, the athlete should start the planning process by working backwards. The structure of the year can then be completed.

One of the most common methods of structuring the athlete's year is by using the process of periodisation. This involves splitting the year up into a number of periods, which themselves may be sub-divided, with various sections of the training process worked on in each particular period. The generalised pattern used is: preparation, competition and then transition. By splitting the year up into broad phases, not only does this help the planning of a peak for one particular year but it should also ensure a progressive development over a series of years, so an athlete may reach an ultimate sporting target.

Overview of the planning module

Exactly how the year is divided can depend on a variety of factors, ranging from when competitions are to how long it may take for an athlete to peak. In this module we look at how to prepare a training programme to meet your objectives.

- Brian Mackenzie identifies the data that you need to collect and how to prepare a training plan to meet your needs.
- Bruce Tulloh looks at how to plan the year for one season, two seasons, three seasons and all-year-round sports.
- Raphael Brandon looks at how to design a sport-specific fitness programme.
- Daniel Bishop provides a blueprint for a self-determined training programme to enhance your feelings of competence in your sport.

The articles in this module are applicable to most sports.

Planning your training is essential – here is how to do it

The detailed planning of an athlete's training programme is essential if both short- and long-term objectives are to be achieved at the right time in the season.

Training plan

The purpose of a training plan is to identify the work to be carried out to achieve agreed objectives. Training plans should be drawn up to identify long-term (say, four years) objectives as well as short-term plans for the forthcoming season. For the rest of this topic I will concentrate on the development of the short-term annual training plan. In its simplest form the plan could comprise a single A4 sheet identifying the overall plan for the year, and more detailed weekly plans identifying the specific activities the athlete is to carry out.

Training year

The start of the training year will depend upon the athlete's circumstances and objectives, but this would generally be around October for track and field athletics in the UK.

Information-gathering

The first stage of preparing a training plan is to gather background information about your athlete and their objectives for the forthcoming season. The sort of information to collect is as follows:

Personal details

- name, address, date of birth, telephone numbers, transport arrangements
- objectives
- performance (time, height, distance)
- technical (development of event technique)
- indoor and/or outdoor season
- experience
- personal best (PBs)
- competition experience (club, county, national, country)

Equipment

- does the athlete have their own equipment?
- harness and tyre
- elastic harness
- weight jackets
- camcorder
- distance, time, percentage-effort matrix

Finance

- where can grants be obtained from?

Competition

- date of main competition
- national and area championships
- school, university competitions
- required qualification times for competitions
- fixture lists – club, county, country etc
- open meetings

Competitors

- who are the competition and what are their personal bests (PBs)?
- recent competition results
- competition behaviour

Athlete's other commitments

- school, college, work, part-time jobs
- family and partner
- hobbies and other sports
- time available for training
- planned holidays

Medical

- previous injuries or illness
- current problems (eg diabetes, asthma etc)
- access to medical support
- physiotherapy support
- on any medication – is it a banned substance?
- using asthma inhaler – application to use Beta 2 agent inhalers

Training facilities

- tracks and other running facilities (bad weather)
- gymnasiums and weight training
- swimming pools, saunas and massage
- coaching workshops

Last season

- what can be learnt from last season?

Key questions for the athlete

- how serious are you about your sport?
- what do expect from your coach?

Periodisation

Periodisation is the method of organising the training year into phases where each phase has its specific aims for the athlete's development.

The phases of a training year

The training year should be divided into phases

- Phase 1 - 16 weeks – Oct, Nov, Dec, Jan
- Phase 2 - 8 weeks – Feb, Mar
- Phase 3 - 8 weeks – Apr, May
- Phase 4 - 8 weeks – Jun, mid-Jul
- Phase 5 - 8 weeks – mid-Jul, Aug
- Phase 6 - 4 weeks – Sep

This assumes that the competition climax will be in August (Phase 5).

What if there is an indoor and an outdoor season?

For the athlete with competitive objectives for both the indoor and outdoor season, the phase allocation for the indoor season could be as follows:

- Phase 1 - 6 weeks – Oct, mid-Nov

- Phase 2 - 8 weeks – mid-Nov, Dec, mid-Jan
- Phase 3 - 6 weeks – mid-Jan, Feb

and the outdoor season as follows:

- Phase 1 - 4 weeks – Feb, mid-Mar
- Phase 2 - 6 weeks – mid-Mar, mid-Apr
- Phase 3 - 5 weeks – mid-Apr, May
- Phase 4 - 7 weeks – Jun, mid-Jul
- Phase 5 - 6 weeks – mid-Jul, Aug
- Phase 6 - 4 weeks – Sep

This assumes that the climax of the indoor season is in February and the outdoor season in August. Depending on your athlete's objectives and abilities, the year start and duration of each phase may have to be adjusted to achieve appropriate development.

Objectives of each phase

The objectives of each phase are as follows:

- Phase 1 – General development of strength, mobility, endurance and basic technique
- Phase 2 – Development of specific fitness and advanced technical skills
- Phase 3 – Competition experience – achievement of indoor objectives
- Phase 4 – Adjustment of technical model, preparation for the main competition
- Phase 5 – Competition experience and achievement of outdoor objectives
- Phase 6 – Active recovery – planning preparation for next season

Activities conducted in each phase of training

The athlete's physical needs that require development are:

- basic body conditioning (including balance, coordination and core stability)
- general and specific strength
- general and specific technique
- general and specific mobility
- general and specific endurance
- speed

Each of these needs is a building block, where specific blocks need to be in place before you progress to the next. Failure to do this may result in injury. How you allocate the blocks to each phase depends upon the athlete's weaknesses and strengths and is for the coach to decide with the athlete.

One approach is to progress the building blocks as follows:

- basic body conditioning
- general strength, endurance, mobility and technique

- specific strength, endurance, mobility and technique
- speed

When progressing from one block to the next, remember to fade one out as the other comes in, and not to switch from one block to the next overnight. Some blocks once started may continue to the end of the season, but at a less intense level, eg mobility. Other blocks to consider are relaxation, visualisation and psychology (mental attitude).

Preparing a plan

The steps in producing a training plan are as follows:

Produce an overall plan template and identify the months/weeks of the year

Identify on the plan at the appropriate period:

- the main competition
- area, national, school etc championships
- qualification competitions
- club fixture meetings
- the six phases based on the main competition in Phase 5

Identify on the plan:

- the blocks (eg strength, endurance) to be developed in each phase
- the period of development for each block
- the intensity of training week by week
- number of training sessions per week
- evaluation points to monitor progress

Identify appropriate training units for each block as appropriate to the phase of development.

Group the training units for each block into training schedules taking into consideration:

- the number of training sessions the athlete can complete per week
- the required training intensity
- the phase of development.

What are a training unit and a training session?

A training unit is a single activity (eg 6 x 60m at 90 to 95% effort with two minutes' recovery) with a set objective (eg develop speed endurance). A training session is made up of one or more training units, eg warm-up unit, technique drills unit, speed endurance unit and a cool-down unit.

What is a training schedule?

A training schedule (microcycle) comprises a number of training units that can span from seven to 30 days.

What are a microcycle, mesocycle and macrocycle?

A microcycle, also known as a training schedule, is a group of training units. The mesocycle, also known as a macrocycle, is a number of repeats of a microcycle.

Goal-setting

Goal-setting is a simple, yet often misused, motivational technique which can provide some structure for your training and competition programme. Goals give a focus, and there are two well-known acronyms to guide goal-setting:

SMART or SMARTER

S - goals must be **Specific**
M - training targets should be **Measurable**
A - goals should be **Adjustable**
R - goals must be **Realistic**
T - training targets should be **Time**-based
E - goals should be challenging and **Exciting**
R - goals should be **Recorded**.

We'll see how this is put into action later on in this module.

SCCAMP

S - goals must be **Specific**
C - within the **Control** of the athlete
C - goals are **Challenging**
A - goals must be **Attainable**
M - training targets should be **Measurable**
P - goals are **Personal**.

FITT principles

The basic principles of fitness training are summed up in the acronym FITT.

F - Frequency – How often?
I - Intensity – How hard?
T - Time – How long?
T - Type – the type of training (strength, endurance etc).

Summary

The training plans for my athletes are based on the six phases discussed above, where each phase comprises a repeated four-week training schedule (microcycle). The workload in the first three weeks of the four-week programme increases each week (easy, medium and hard) and the fourth week comprises active recovery and tests to monitor training progress. The aim of the four-week cycle is:

- to build you up to a level of fitness (three weeks)
- test, recovery and adjustment of the training programme (one week)
- to build you up to higher level of fitness (three weeks)
- test, recovery and adjustment of the training programme (one week)
- to build you up to an even higher level of fitness (three weeks).

The content and quantity of training in each week and phase will depend on many factors. Remember a training programme is athlete-specific, and the results of the tests in the fourth week can be used to adjust the training in the next four-week cycle to address any limitations.

Brian Mackenzie

Planning the year – overview

Periodisation means 'dividing a season or a year into separate periods'. It follows from this that within each period or phase there are different objectives. I prefer to use the word 'phase' because it fits the concept better. 'Periods' are thought of as having precisely fixed timescales, like school periods, where as phases are usually thought of as transitional, things which one moves through. One phase merges into another and this is what should happen with a properly organised training programme.

The one-season sport

If your sport is a 'summer only' sport, such as rowing or cricket, the phasing takes care of itself. The competitive season, from May to September, is followed by a break (say, of one month). There is then a 'basic fitness' or 'maintenance' phase that might last until February. This is followed by the 'build-up phase' and the 'pre-competition phase'. With a winter sport such as rugby there will be a six-month competitive season, and with football there may be an eight-month season. The long competitive season poses a particular problem, one that has no satisfactory solution, but this article may help to clarify the coach's thoughts.

Two-season sports

British distance runners usually have a track season, from May to September, and a cross-country season that runs until March and may start in October. To this, one must add road relay competition in spring and autumn, indoor racing in

winter, and the never-ending season of road racing. The current decline in British distance running standards, in spite of increasing numbers of participants, may well be attributable to the surfeit of competition, which makes phasing more difficult. The sportsperson who spends the European winter competing in Australia or the person who plays tennis in the summer and squash in the winter is in the same position.

Three-season sports

It might be better to speak of 'three-peak' sports here: a rugby player who has a pre-Christmas peak, a Sevens tournament at Easter and an overseas tour in August, or a distance runner who runs 10,000m on the track in the summer, a marathon in the autumn, and cross-country from January to March.

All-year-round sports

The majority of road-runners come into this category, as do those who have reached international level in golf or tennis.

The problem

The difficulty is that the human body cannot tolerate a high stress level indefinitely. When a small amount of stress is imposed, the body responds. Hormones are produced which raise the level of performance and speed up the rate of recovery. If the stress increases, the body responds yet again, but if the stress persists at a high level the system will eventually 'crash', leading to the over-training syndrome described by Dr Richard Budget (*BMJ*, vol 309, 13 August 1994). The obvious signs of this are:

- loss of performance
- depression and irritability
- disturbed sleep pattern
- increased resting pulse rate
- loss of weight
- frequent minor infections.

When the training and competition regime is being worked out, remember that the body responds to the total stress load, not just to the stress of training and competition. Thus, if the athlete is getting married, taking important exams or moving house (or all three at once), they should not be subjected to the normal amount of training stress. Competition should either be deferred or restricted.

The next thing to bear in mind is that competition and hard training are destructive processes. Muscle cells are damaged, electrolytes are leaked, glycogen stores are depleted, blood cells are destroyed, and in contact sports the damage may be even more severe. The rate of recovery from the hard work is an individual thing and even the fittest full-time athlete cannot train hard every day.

On the other hand, most athletes are a long way from reaching their full fitness potential. A top-class distance runner can put in three running sessions a day, totalling over 120 miles (200K) per week, plus two swims and a gym workout, and the athlete can maintain this for weeks on end, if carefully supervised. Contrast this with the club rugby player who complains that they are too tired from their weekend match to train two evenings a week.

The solution

If we think of the body as a machine, then there should be at least one time of the year when we take the whole thing to pieces, replace or strengthen the worn-out parts, oil it, protect it, put it together again and test it. For the human body, this involves analysing the sport and deciding which parts really need building up, and which can be left to repair themselves.

The resting phase

Proper rest is vital and must be programmed into each day, week and phase of the year. But in addition there should be a resting phase, if only a brief one, at the end of each competitive phase. During this time the stress level should be at its lowest, enabling the anti-stress system to regenerate. This does not mean that physical exercise should stop; I am convinced that it should not, but that there should be a complete change of routine. The rower should get out of their boat, the footballer should go fishing, the runner should go walking and the walker should get on their bike. Two to four weeks of this will probably be enough.

The basic fitness phase

Here, as far as possible, one should be training the whole body, but even so there will be differences between sports. Those who rely more on muscle strength will spend more time on weight training, while others will devote more time to flexibility, to endurance or to oxygen uptake, but any serious athlete should be covering all these fields, because without them they will not be fully fit and will thus be less able to meet the demands of the hard pre-competition phase.
If the athlete is trying to improve from the previous season, they will have to get used to putting in more hours per week. It makes sense to increase the volume of the training first and then to gradually introduce training of a higher intensity, first one hard session a week, then two. The length of this phase is really governed by the time which needs to be spent on the next, most vital, phase.

Pre-competition training

Training is specific to the event. It is no good being the best at training four hours a day if you cannot produce your best in the competition, so you need to analyse the demands of the competition. The runner is getting ready for a race that might last for less than four minutes (a mile), less than 14 minutes (5000m) or over two

hours (a marathon). A footballer (any kind) has to be fit for intense 10-second bursts of running and for brief but extreme exertions of strength, but they must also be able to cope with spending 90 minutes or more on their feet at a time, maintaining their mental and physical agility under conditions of great stress. Their training programme must therefore include a lot of endurance work as well as skill, speed and strength training.

Hard training is most effective if one can train different elements on different days, or at different times of day. Adding a training load to an already tired body is a recipe for disaster, and the coach must choose the right balance of rest and exercise. In the beginning, 'little and often' is a much better way of building up fitness than the 'train till you drop' method.

At a low level one might start with one hard and three easy sessions a week, with the hard day being similar to the competition but less intense. In the easy sessions the athlete could incorporate different elements of the necessary training, one day long and slow for endurance, one day with some leg speed training, one day in the gym for strength and flexibility.

A year later the same athlete might be doing six sessions a week, two hard and four easy, and a couple of years further down the road they might be doing 12 sessions a week, six for endurance and recuperation, three for hard event-specific training, and three others for minor elements such as speed or flexibility. An example of an event-specific workout might be 4 x 3K for a marathon runner, while for a footballer it might be a circuit of sprints and drills with short recovery breaks.

As the competition season approaches, one tries to integrate all the different aspects of training. The total training load is reduced and the hard training sessions come closer to simulating the competition conditions, but they are spaced out by longer recovery intervals. Practice games and trials lead into the next phase.

The competitive phase

This is not as simple as it seems. If one did nothing but compete and recover from competition, the performance level would soon flatten out and then start to drop. In my view it is hard to perform consistently at a high level for more than six weeks without a break. There should be some sort of 'refresher course' after six weeks. This can be done either for the whole team, or, if the programme does not allow for a break, certain members of the squad should be taken out and put through a mini-cycle of training before going back into competition.

During competition, there must be some training to maintain the basic strong points. The runner must preserve their aerobic fitness and endurance; therefore their total mileage must not drop too much. The 'explosive' athlete must maintain their strength levels, so time must be found for strength training.

Monitoring

The coach has to keep a close eye out to spot the signs of over-training or over-competing as soon as they start to occur. Keeping a daily check on the athlete's resting pulse and body weight will give a good indication, and getting either the athlete or the coach to keep a diary recording the athlete's response to each session is even more revealing. The more the coach is aware of the athlete's condition, the more likely the athlete is to keep fit through a long season. The athlete must try to control the environment so that stress does not become too great. Above all, the athlete must realise that if there are to be peaks in a sportsperson's life, there must also be troughs.

Bruce Tulloh

How to design a sport-specific fitness programme

The fitness trainer is now becoming accepted as a necessary member of the modern coaching team. This new coaching model has the head coach leading a team of specialist coaches, therapists and sports scientists. For example, a secondary technical coach, a physiotherapist, a psychologist, a fitness trainer and a physiologist accompany the head coach, with each performing their specified role, but communicating and working as a team.

For elite sports, the trainer should be able to design workouts that cover all relevant fitness areas: strength, flexibility, agility, aerobic and anaerobic endurance and speed. These workouts must be both specific to the sport and suitable for the level of the athlete. In addition, the trainer should be able to assess fitness levels, understand physiological and biomechanical test data, liaise with physiotherapists regarding injury prevention and rehabilitation, and also be able to pass on sound nutritional instruction. This job description, if carried out to full capacity, requires a great deal of expertise and experience and is likely to be beyond the knowledge base of most head coaches. Thus, the advantage of using a specialist fitness trainer is that they have the specific skills, experience and time to optimise the physical preparation of the athlete.

The purpose of this section is to explain the principles behind designing a sport-specific fitness programme and describe some of the important training methods that should be employed. Specifically I will discuss fitness assessment procedures, and analyse the fitness demands of a sport: strength and power training, balance and stability training, endurance training, and speed and agility training.

Fitness assessment and needs analysis

The principles behind designing sports training programmes are analogous to the methods used by corporate management consultancy firms. When asked to provide a business solution, a management consultancy firm will begin by

establishing the goal the client wants to achieve. They then assess the client's current status, systems, markets, etc. The final step is to calculate what is required to bridge the gap between the client's current status and what they need to achieve their business goal. This final step is called gap analysis. The plan they implement is based completely on the outcome of the gap analysis.

This gap analysis model is exactly how a sports fitness programme should be designed:

- Step 1 is to set the athlete's or team's goals: what do they want to achieve?
- Step 2 is to assess the athlete's or team's current level of fitness. This assessment must cover the entire relevant fitness areas specific to their sport or event.
- Step 3 is the gap analysis, which is calculating the difference for each fitness component between the current and ideal fitness levels.
- Step 4 is designing the training programme that will improve each respective fitness area to the required level.

This example should clarify the situation

Player profile: Male 19-year-old national tennis player. Some weight training experience and completes regular cycling and treadmill workouts.

1. Goal – To become a professional player on tour
2. Establish fitness status

Test	Fitness area	Current	Ideal
Multi-stage fitness test	Aerobic	VO_2max = 52	VO_2max = 55
30m sprint	Speed	4.2 sec	3.9 sec
Standing long jump	Leg power	2.3m	2.8m
Overhead medicine ball throw	Arm power	16.1m	16m
20m shuttle run	Agility	4.7 sec	<4.5 sec

Gap analysis

Aerobic fitness is pretty good – not far off ideal. All the sprint, agility and leg power tests are below ideal, especially the standing long jump test, suggesting that leg power could be improved. Arm power is fine and therefore needs only to be maintained.

The programme

The player has a six-week period of no competitive tennis and so we will devise a plan to improve leg power and agility for this period, while maintaining upper body strength and aerobic fitness.

Monday	Frappier drills, squat jumps, standing long jumps, hexagon drill, lateral hops Resisted sprints, 10 x T drill, two minutes' rest
Tuesday	Power cleans, squats, leg curls, power lunges, medicine ball for upper body and trunk
Wednesday	As Monday
Thursday	Easy aerobic session plus medicine ball work
Friday	Rest
Saturday	As Monday

The progression over six weeks would be to increase the intensity of the drills and the weights lifted in the gym, eg replace squat jumps with drop jumps into lateral sprint. By the end of the six-week period the player would be re-tested and hopefully we would see improvements in 30m sprint, standing long jump test and 20m shuttle run test.

The training programme

The assessment results are analysed to establish which fitness areas need to be developed to raise competitive performance. The design of the training programme should prioritise these areas to bring them up to scratch. The fitness areas that are already good can simply be maintained. This principle recognises the fact that it is difficult to develop all aspects of physical performance at once. This is because of both practical issues (there may be simply a lack of time to work on all areas during the training week) and physiological issues (in that endurance training compromises strength and power development). The following sections will briefly describe appropriate training methods and their dosage for each of the fitness aspects.

Strength and power

At some stage every athlete needs to develop strength and power. The best results are achieved with by training two to four times a week, with little concurrent endurance training. In competitive periods, this is not practical for many sports, although research has shown strength maintenance, and sometimes improvements, are possible through a season with regular strength training. The best solution is for strength and power development to be planned for the off-season and then maintained through the season.

To develop maximum strength, a weights exercise session should be designed. A typical session comprises five to 10 exercises with two to four sets of five to 12 repetitions maximum (RM) per exercise. To develop power, plyometric exercises are most commonly used. A session comprises five to eight exercises with a total of 100 to 300 foot/shoulder contacts per workout, depending on the athlete's level and time of year. Weights and plyometric exercises can be combined in the same session. This is called complex training and is very effective for peaking.

Always choose weights and plyometric exercises that are functional to the sport or movement. For example, squats and drop jumps are better for vertical jumping ability than power lunges and standing long jumps, which are better for horizontal jumping or sprints. For another example, choose free weights instead of machines as synergistic muscles are involved to stabilise. Think about the type of contractions involved in the sports movements – eg hamstrings' eccentric function – the joint angle and the speeds of movements.

Sometimes upper body strength is incorrectly overemphasised. For instance, in tennis upper-body power training is more important, as a racquet only weighs 400 grams. If your 1RM squat is not significantly more than your 1RM bench press, then you have been doing too much upper-body work in the gym.

Aerobic endurance

Aerobic fitness is primary for most sports. However, it is not the only fitness area and if it is focused on too much, it can be detrimental to strength and power which are equally, if not more, important in many sports. Trainers must think carefully about the fitness level they believe is appropriate for peak performance and then achieve that. For example, in elite football a high aerobic capacity is important, but for volleyball a moderate level will suffice. For most games, aerobic fitness governs how quickly one recovers between high-intensity sections, and how much distance can be covered in a game.

Anaerobic endurance

Anaerobic endurance is also important for many sports. This is the ability to work at a high intensity repeatedly. Both the lactate system and the ATP-PC system should be trained (more about these in a later module), but targeted in the correct proportions for each sport. For instance, tennis focuses almost solely on the ATP-PC system, due to short bursts and the frequent rest-play pattern, whereas squash requires significant lactate system training as it is much more continuous. Anaerobic endurance can be developed with training two to three times a week.

Speed and agility

Speed and agility are key to many sports but often in very different ways, each sport having its own particular demands. For instance, fencing requires very quick footwork and acceleration but all movements are linear – forwards and backwards. In contrast, racquet sports are multidirectional, with as much lateral movement as linear.

In addition, different sports have different speed profiles. Racquet sports require very fast off-the-mark acceleration, but maximum speed over a longer sprint of 30 to 60m is less important. Rugby and football require both good acceleration

and maximum speed. Therefore maximum speed and acceleration need to be differentiated in training.

Speed training sessions must always include long rest periods and focus solely on quality. Speed development is about teaching the neuro-muscular system to operate at full speed and power and this is not possible if there is any fatigue. If rests are too short, the training will only develop speed endurance and not maximum speed.

Balance, coordination and stability

A final area that must be incorporated into a sports training programme is balance, coordination and stability training. Economy of movement, peak power and agility cannot be optimised unless the athlete has highly developed balance and stability.

Balance and coordination have to be developed through many different methods as variety is important. Exercises on the wobble board and balance beam are great for this. With a little imagination one can think of many things to challenge an athlete's balance and coordination, eg balancing on a wobble board while juggling.

Stability, especially in the trunk, must also be developed through various methods. I recommend using gymnastic balls, and learning some Tai Chi moves, as well as using a medicine ball for the stomach and lower back exercises. Particularly effective are static bridging exercises, eg the plank, for developing functional core stability. A stability workout should be performed at least twice a week.

Raphael Brandon

How to design a self-determined training programme that will drive you to new heights

Have you ever stopped to wonder why some individuals stick with a structured training schedule while others give up at the first obstacle? Or why, three months into your perfectly planned programme, your enthusiasm dwindles? The reasons for some people's persistence in following an exercise programme have been researched for many years, with no conclusive answers (see Dishman, 1993, for a review).

Among the proposed explanations, to name but a few, are: the attributes of the individual, their occupation, biomedical status, environmental factors, and time. The complex and rich phenomenon that affects all of these to some

degree is motivation. As you may know, Deci and Ryan in 1985 proposed their Cognitive Evaluation Theory, which posits that intrinsic motivation is maximised when individuals feel competent and self-determining when dealing with their environment.

For you as the dedicated exerciser, this means that you have some control over the content of your exercise programme and its outcomes, rather than being dictated to by the schedule itself. Intrinsic motivation means simply the reasons for taking part in a particular activity – in our case, physical conditioning for peak performance – which come from inside the individual. More specifically, intrinsically motivated athletes participate because they find the activity inherently enjoyable, rather than for external rewards, eg coach recognition, which is called extrinsic motivation.

I am going to provide you with your own blueprint for a self-determined training programme to enhance your feelings of competence in your sport. In turn, the programme will provide the motivational push you may need in order to achieve your particular goals. Along the way, I will combine proven theoretical material with some of my own practical knowledge to enable you to motivate yourself to levels you did not think possible.

Goal-setting: get SMART

Goal-setting is a simple, yet often misused, motivational technique which can provide some structure for your training and competition programme. Goals give a focus, and the key to effective goal-setting is the SMART principle.

a) First, goals must be **Specific**. Research has shown (Locke & Latham, 1990) that specific goals work better than general 'do your best' goals. For example, if you are a runner, rather than professing a desire to reduce your 5K time, you should state: 'I intend to knock 20 seconds off my 5K time over the next six months'.

b) Your training target ought to be **Measurable**, as in the above example. Simply saying that you want to trim your 5K time is insufficient; you need some accurate means of charting your progress. This means that continuous monitoring is needed, but this can become a bore. Thus I would recommend that you build into your training schedule a regular 'measurement day' on which you test yourself in various disciplines. This can take place once a week or even once a month, but the idea of the day is to reduce your preoccupation with times and improvement. Certainly, the therapeutic benefits arising from a relaxed (non-timed) workout can help to alleviate stress, reduce symptoms of depression and leave you ready to proceed with an otherwise arduous training schedule (see Morgan, WP, Ed, 1997, for coverage of the physical activity and mental health literature).

c) Goals should also be **Adjustable**. Goal-setting is a dynamic process. If, for instance, you become injured during a competitive season, you should be able to lower your targets accordingly. On the other hand, you may make such rapid progress that you can raise them. Ultimately this means that they must conform to the first two criteria: being specific and measurable.

d) Goals must be **Realistic**. It is all very well saying 'I want to break Daniel Komen's 5K record', but unless you are his (as yet, undiscovered) identical twin, then that does not seem a realistic goal. This is an extreme example, but you also must recognise that your room for improvement shrinks as you get near your full potential – the well-known Law of Diminishing Returns. Conversely, goals should be difficult enough so that you are not struck down by acute boredom because you have achieved them too easily.

e) Finally, your training targets ought to be **Time**-based. If you do not give yourself a specific time frame in which the goal must be achieved, the urgency for attainment is reduced. The previous example of trimming the 5K time by 20 seconds within six months satisfies this criterion. Try to resist the temptation to move these time constraints back to accommodate life events, such as minor injuries; the result is that the value of the time limit is negated. It is important to identify when this happens, and to set about designing new objectives with new time parameters. This way your goal-setting plan will not lose its effectiveness.

Make no mistake about it – goal-setting is a skill that needs to be mastered just like any other. But by using the following model, you can make the process a little less taxing.

The interval goal-setting model

The interval goal-setting (IGS) model was devised by Frank O'Block and Frederick Evans in the early 1980s to provide a quantifiable means of setting training targets. The model was developed in order to help coaches and athletes set more realistic and achievable goals, and it takes into consideration the athlete's past five performances when determining their target performances. It embodies most of the fundamentals of SMART goal-setting. I will guide you through the requisite steps so you need to make a minimum of effort.

First, sit down and establish one or more long-term goals for yourself, using the SMART principle of goal-setting: where do you want to be in, say, a year's time? What competition do you wish to do well in? Or what long-term personal achievements do you consider to be crucial to your sense of accomplishment? Any effective goal-setting plan consists of three main types of goal: long-term, intermediate and short-term. If your long-term aim is in one year from the start of your training, then intermediate goals could be between two and nine months, and short-term within eight weeks. The IGS model works most effectively for short-term goals.

The following variables are required in the IGS model computation:

A = your average time over the last five performances
B = your best time within the last five performances
C = the difference between your average and best performances (A - B)
D = the lower boundary of your target interval
E = the interval midpoint
F = the upper boundary of the target interval

For example

Here is how to utilise the IGS model for a 5K run time:

a) Record your five last performance times – 16:47, 16:55, 16:44, 16:46, 16:52
b) Find A, the average of the five times = 16:49
c) Find B, the best time from the five performances = 16:44
d) Find C, the difference between your average (A) and your best time (B)
C = A - B
C = 16:49 - 16:44
C = 0:05
e) Find D, the lower boundary of the interval, or the best time you recorded – for this example it is B, so D = 16:44
f) Find E, the interval midpoint
E = D - C
E = 16:44 - 0:05
E = 16:39
g) Find F, the interval upper boundary
F = E - C
F = 16:39 - 0:05
F = 16:34

What it all means

You now possess a collection of figures that represents your target interval. In order to clarify the computation results, you can show the model graphically. Draw a horizontal line 10cm in length; mark your average and the upper boundary as 1cm vertical lines at the right and left ends respectively, so that a reduction in time is represented by a shift along the scale from left to right. At a point 2.5cm from the left end of your line (your average time), mark another vertical line for your previous best; this forms the lower boundary of your target interval. At the halfway point along the continuum, you should draw another vertical line, to represent the midpoint of the interval.

What this shows is that the interval midpoint is realistically higher than your previous best, by as much as your previous best exceeded your average. The upper boundary of the interval is to allow for particularly exceptional performance. In the example above, a reduction in time of 10 seconds from the previous best time is quite considerable, corresponding approximately to a

reduction from 5:23 per mile pace to 5:20. While this may seem only a measly abatement, let us not forget that this corresponds to a difference in performance from one week to the next!

Modifying the model

Subsequent IGS increments can be computed with each new performance after the sixth has been recorded, to ensure that fresh dynamic targets are continually being set. All you need to do to find the next interval target is to discard the previous first time from the analysis and include the sixth. This is repeated every time a new time trial is recorded. I recommend that you pin up the IGS model in a prominent place so your family and friends can see it. Publicly declared intentions are more likely to be stuck to than those kept hidden. I have made a sheet covered in sticky-backed plastic, which acts as a wipe off model, so I can renew my targets frequently.

To modify the IGS model to allow for increases in performance scores, such as those encountered in progressive weight training, make the following adjustments: C becomes B - A, E becomes D + C and F becomes E + C.

When carrying out the graphical computations, the only adjustment you need to make is to reverse the sum for each of parts a, c and d. For example: F - A instead of A - F.

Keeping SCORE with rewards

Perhaps you act as a coach, exercise leader or in a similar capacity. One primary role of the coach is as a motivator, and another useful goal-setting tool for the coach is that of token rewards. These can influence performance without a goal-setting programme, or vice versa. However, when the two are used in conjunction, the possibility of performance enhancement is increased (Locke, Shaw, Saari & Latham, 1981). The word 'token' is important because the rewards must not have any real value or worth for the athlete or their motivation will ultimately be undermined. Deci (1971) explained two further salient aspects of rewards, namely that they can be 'controlling' or 'informational'.

If the controlling aspect of any reward is considered to be overly important by the athlete, their levels of motivation will decrease, since they perceive the coach to be externally manipulating their performances. If, however, they perceive the reward as purely informative, the reward will affect their perception of their own competence. If the information implies ability, intrinsic motivation will increase. If it implies a lack of ability, then intrinsic motivation will decline. Bearing this in mind, the successful coach will follow the SCORE guidelines:

- **Simple.** Choose a reward system that can be easily implemented, such as points, rather than major items, eg medals. The athlete can then accumulate a

score for periodic evaluation.

- **Consistent**. Be consistent when giving out rewards and consistently target behaviours such as a performance landing within a target interval of the IGS model.
- **Observable**. Pick target behaviours that can be easily evaluated, such as those encountered in the SMART programme.
- **Reachable**. Make sure that you choose to reward behaviours that are not comparative, ie they should not be dependent on the performance of others. To use sport psychology language, use rewards to encourage your athletes to strive for 'performance' or 'process' goals rather than 'outcome' goals (Duda, 1992). Performance goals are concerned with improvement in relation to one's own previous best performance, such as in the IGS model. Process goals focus on the aspects the athlete has to work on in order to succeed in attaining their ultimate aim, eg a swimmer focusing on an increased arm reach in order to improve their swimming economy. Outcome goals are primarily concerned with winning. If coaches continually stress these goals, their athletes are headed for disappointment because of an inevitable dependence on the performance of others. Even the very best athletes, at the top of their sport, however much they aspire to win, set themselves performance and process goals in training.
- **Explanation**. Finally, explain to your athlete at the beginning of any particular training session (maybe a 'measurement' day) the targets to be rewarded. For instance, 'one point will be accredited to anyone performing above their average, two points to anyone reaching the target interval, three for above the midpoint...' etc. Athletes who do not perform to the specified levels go unrewarded. This is referred to as 'contingency management'.

The two acronyms that I have used in this article, SMART and SCORE, will go a long way towards ensuring that your training programme, when combined with the IGS model, develops near maximum effectiveness. You may have noticed that they both rely on the emergence of various successes along the road to peak performance. These successes develop an overall perception of individual competence, which brings me to my final point.

A word about 'self-efficacy'

Self-efficacy (SE) (see Bandura, 1977 and 1986) represents the belief that one can successfully negotiate a chosen course of action, such as the execution of a particular sports skill. It can be described as a kind of situation-specific self-confidence. People with high SE participate more readily, work harder, persist longer when they encounter difficulties, and achieve at a higher level. In short, they are more motivated (Schunk, 1995). The general principles of effective goal-setting must be adhered to, ie SMART goal-setting with constant feedback (perhaps in the shape of rewards), in order for efficacy beliefs to be enhanced and maintained. SE arises from a range of sources, which I have listed here in descending order of importance.

- Past performance accomplishments. If an athlete continually experiences success in an activity, within the constraints of the training programme, they will feel more able to perform that activity. Past performances are reckoned by Bandura to have a reciprocal relationship with SE. In other words, not only do past accomplishments induce greater SE, but also a greater sense of SE can affect the person's subsequent performance.
- Vicarious experience. This means seeing other people, most often peers, successfully reaching a target, thus instigating a feeling of 'If they can do it, so can I!' This suggests that it makes sense to surround yourself with people whom you consider to be similar to yourself in terms of build, age, ability, etc so that realistic positive role models abound. Obviously this could be achieved by joining a suitable club.
- Verbal persuasion. This is a mildly effective method of inducing SE, and can easily be implemented by coaches and team mates. However, verbal persuasion is reckoned to have greater impact when it comes from someone who is perceived as a trusted and credible source of information. Feltz (1992) also considers self-talk and imagery to be forms of persuasion.
- The athlete's 'psychological arousal' is also regarded by Bandura as a factor in determining their sense of efficacy. Heightened physiological signals such as elevated heart rate are sometimes interpreted as signs of anxiety, leading to a preoccupation with them that can damage performance.

Finally, the concepts of goal-setting and rewards can be incorporated into a holistic perception of competence, namely global self-efficacy. A SMART programme sets out difficult but attainable goals. Consequently, efficacy perceptions should increase as successive targets/objectives are reached. Similarly, the token rewards that the coach gives for desirable behaviour or performance can become tangible evidence of competence in the goal-setting programme. Use the techniques highlighted in this article and stick to their guidelines, and I can guarantee that your training will motivate you to new heights.

Daniel Bishop

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