International Shooting Sport Federation
ISSF
National Coach (first level)
______________________________________________
SPORT SCIENCE
Contents

Chapter 1 – Motivational climate
Chapter 2 – Performance profiling
Chapter 3 – Goal setting
Chapter 4 – Communication
Chapter 5 – Instructions and feedback
Chapter 6 – Principles of physical training
Knowledge About your Sport

- Technical skills
- Mental demands
- Physical demands

Competitive structure (annual, quadrennial)
Knowledge About your Performer

• Age and ability
• Stage of development
• Aspirations
• Strengths and weaknesses
• Level of motivation and commitment
• Time availability from work, school, etc.
What Is Motivation?

• Motivation is the *direction* and *intensity* of effort
  
  – *Direction of effort* refers to whether an individual seeks out, approaches, or is attracted to situations
  
  – *Intensity of effort* refers to how much effort an individual puts forth in a situation

• Direction and intensity of effort are closely related

Weinberg & Gould (2019)
Motivation
(Modeled from Weinberg & Gould, 2019)

- **Personal factors**
  - Personality
  - Needs
  - Interests
  - Goals

- **Personal/situational factors**

- **Situational factors**
  - Coach style
  - Facility attractiveness
  - Sport achievements

**Individual motivation**
Major Motives for Sport Participants

• Improving skills
• Having fun
• Being with friends
• Experiencing thrills and excitement
• Achieving success
• Developing fitness
Three main theories of motivational processes

- Attribution
- Achievement goal
- Self-determination
Basic attribution categories

- Stability
  - Stable vs. unstable

- Locus of causality
  - Internal vs. external

- Locus of control
  - Controllable vs. incontrollable

- Emotional reactions (e.g., pride, shame)
- Behaviours (e.g., choice, commitment, persistency, effort)
- Performance expectations
Achievement Goal Theory

• **Performance (ego) goal orientation** (or competitive goal orientation): Comparing performance with and defeating others

• **Mastery (task) goal orientation** Improving relative to one’s own past performances
Motivational Climate

Significant others
- coaches
- parents
...

Mastery

Task

- Cooperation
- Learning and improving
- Personal engagement rewarded
- Personal improvement rewarded
- Mistakes part of learning process

Performance

Competition

- Outperforming others
- Best athletes rewarded
- Emphasis on results
- Mistakes are punished
Achievement Goal Theory

Skills development through:

- **Task**: Varied and challenging
- **Authority**: Responsibility and independence for learning
- **Recognition**: Personal recognition for accomplishments
- **Grouping**: Cooperative learning and peer interaction
- **Evaluation**: Based on mastery of tasks and improvement
- **Time**: Time requirements attuned to individual abilities

( Epstein, 1988)
Basic psychological needs
- autonomy
- competence
- relatedness

Intrinsic motivation
- knowledge
- accomplishment
- stimulation

Adaptive outcomes
- autonomous behaviour
- engagement
- persistence
- enjoyment
- well-being
- optimal functioning
- sportsmanship

Self-determination theory

Coach behaviour
The self-determination continuum

- Amotivation
- Extrinsic motivation
- Intrinsic motivation

- Controlled motivation
- Autonomous motivation
Self-determination theory

Basic psychological needs satisfaction

- Encourage initiative
- Involve in the decision-making process
- Offer opportunity to choose goals
- Give a rationale for task-engagement
- Use non-judgemental behaviour
- Consider the athlete’s perspective
Sport Science
ISSF National Coach (first level)

Contents

Chapter 1 – Motivational climate

Chapter 2 – Performance profiling

Chapter 3 – Goal setting

Chapter 4 – Communication

Chapter 5 – Instructions and feedback

Chapter 6 – Principles of physical training
Athlete-Coach relationship

Potential problems

• Athlete usually has a relatively passive role in the assessment process and skill acquisition/improvement

• Locus of control is external => loss of intrinsic motivation
PERFORMANCE PROFILING
(Butler & Hardy, 1992)

Proposed solution

• Individuals make sense of the world by constructing personal theories
• Personal theories are unique and individual
Performance Profiling Main Objectives

✓ To develop awareness of important qualities essential for success in a sport
✓ To consider performance from a joint coach and athlete perspective
✓ To aid in identifying an appropriate intervention in desired areas of change
✓ To assist in training programme focused on best performance
✓ To monitor changes over time
Performance Profile of a rifle shooter

**PSYCHOLOGICAL**
- consistency
- ability to analyse
- perform under pressure
- self-awareness
- visualising
- mental preparation
- self-confidence
- concentration
- positive thinking
- refocus

**TECHNICAL**
- shot routine
- preparation
- hold
- inner feeling
- trigger control
- aiming
- timing
- sighting
- breathing

**PHYSICAL**
- fitness
- stamina
- cardio fitness
- core stability
- strength
- balance
- breathing control
- flexibility
- knee, hip stability

---

20
Performance Profiling Methodology (1/2)

**Stage 1: Introducing the Idea**
- increase awareness of athlete’s current state
- show completed performance profiles
- no right or wrong

**Stage 2: Eliciting Constructs**
- characteristics that ‘ideal’ performers possess
- individual/squad brainstorm constructs
- individuals select pertinent qualities
- ideal qualities rated from 0-10
Performance Profiling Methodology (2/2)

**Stage 3: Assessment**
- rate current perception
- 0-10 scale

**Stage 4: Establishing scores**
- subtract current from ideal

**Stage 5: Prioritise targets and link to goal setting**
Performance Profiling (1/2)

Summary

PP serves to illuminate:

• The athlete’s perspective
• Areas of perceived strength
• Areas of perceived need for improvement
• The athlete’s vision of what constitutes a top performance
• Where the athlete might resist improvement
Summary

**PP serves to illuminate:**

- Athlete and coach discrepancy
- Targets for goal setting
- Performance analysis
- Progress
- Attitudes towards training
Performance Profiling Promotes

✓ Intrinsic Motivation
✓ Self-evaluation
✓ Goal-setting
✓ Decision-making
✓ Perceptions of control
✓ Matching interventions to the individual
Contents

Chapter 1 – Motivational climate
Chapter 2 – Performance profiling
Chapter 3 – Goal setting
Chapter 4 – Communication
Chapter 5 – Instructions and feedback
Chapter 6 – Principles of physical training
WHAT ARE GOALS?

• **Goals** – are like magnets that attract us to higher ground and new horizons. They give our eyes a focus, our mind an aim, and our strength a purpose. Without their pull, we would remain forever stationary, incapable of moving forward . . . A goal is a possibility that fulfills a dream (Lessin, 1999)
Defining Goals and Types of Goals (1/2)

- **Subjective goals**: General statements of intent such as having fun or doing your best

- **Objective goals** (scientific definition): Attaining a specific standard of proficiency on a task, usually in a specified time
Defining Goals and Types of Goals (2/2)

- **Outcome goals:** Focus on a competitive result of an event (e.g., beating someone)

- **Performance goals:** Focus on achieving standards of performance or objectives independently of other competitors—usually making comparisons with one’s own previous performance

- **Process goals:** Focus on the actions an individual must engage in during performance to execute or perform well
Why Goal Setting Works

- **Indirect thought process view**
  Goals influence performance indirectly by affecting psychological factors, such as anxiety, confidence, and satisfaction.

- **Direct mechanistic explanation**
  Goals
  - direct attention to the important elements of the skill
  - mobilize performers’ efforts
  - prolong performers’ persistence
  - foster the development of new learning strategies
Principles of Goal Setting

SMARTER Goals

▶ Specific
▶ Measureable
▶ Action oriented and agreed
▶ Realistic and challenging
▶ Time-phased
▶ Exciting/Enjoyable
▶ Recorded and Re-evaluated
GOAL SETTING PROCESS

- Set goals
- Secure commitment
  - Identify barrier and construct action plans
  - Obtain feedback and evaluate goal attainment
  - Reinforce goal attainment
Sport Science
ISSF National Coach (first level)

Contents
Chapter 1 – Motivational climate
Chapter 2 – Performance profiling
Chapter 3 – Goal setting
Chapter 4 – Communication
Chapter 5 – Instructions and feedback
Chapter 6 – Principles of physical training
Much of human interaction consists of trying to influence others’ thoughts and behaviors.

Communication occurs frequently in sport contexts:

- Athletes interact with teammates, opponents, officials, and coaches.
- Coaches influence athletes by creating a good environment in which athletes develop abilities and skills to succeed.
- Communication process involves a series of strategies to effectively influence the
Communication

→ You can communicate without motivating but it is impossible to motivate without communicating.
  - John Thompson, former Georgetown University men’s basketball coach

→ It is not what you tell them—it’s what they hear.
  - Red Auerbach, former Boston Celtics championship coach
Good communication skills

- are a key factor that helps improve performance
- play a key role in achieving personal growth in life and sport
Communication Keys

- All communication contains **content** (what is said) as well as **relational** (how we felt about the person’s message) information.
Communication

Sending Messages Effectively (1/4)

- Convey rationales
- Make verbal messages clear and concise
- Be direct
- Be complete and specific
- Be clear and consistent
Separate fact from fiction
Focus on one thing at a time
Deliver messages immediately
Be supportive
Be empathetic by “placing yourself in the shoes” of your athletes
Physical appearance, posture, gestures, and voice are important components of nonverbal messages.

Nonverbal communication:

- 50 to 70% of all communication is nonverbal
- Nonverbal messages are harder to hide
Be consistent with your nonverbal messages

Reinforce with repetition

Make messages understandable and appropriate to the receiver’s frame of reference

Use feedback to make sure that your message has been interpreted correctly
Communication
Receiving Messages Effectively (1/3)

Active listening
- Ask questions
- Paraphrase
- Attend to main and supporting ideas
- Acknowledge and respond
- Give appropriate feedback
- Pay attention to the speaker’s total communication (verbal and nonverbal)
Communication
Receiving Messages Effectively (2/3)

Keys to active listening

- Mentally prepare to listen
- Don’t mistake hearing for listening
- Paraphrase what the speaker said
Receiving Messages Effectively (3/3)

Supportive listening
- Communicate that you are *with* the speaker and value his or her messages and perspective

Keys
- Use supportive behaviours as you listen
- Use confirming behaviours as you listen
- Use both verbal and nonverbal listening behaviours
Communication

The “Sandwich Approach” to Giving Feedback

- A positive statement
- A future-oriented instruction
- A compliment
Communication
The “Sandwich Approach” to Giving Feedback

Find something the athlete did right and reinforce it

Tell the athlete how to correct a mistake – emphasize the good things that will happen as a result

End with a general performance-related positive statement
Example of the Sandwich Approach

Positive statement
“Linda, it’s great to see you’re really working hard”

Future-oriented statement
“Next time try to slow down and pay attention to the timing of your movement”

Compliment
“You’re getting there, Linda; keep it up”
The GROW model of communication
(modified from Whitmore, 2009)

<table>
<thead>
<tr>
<th>Goal</th>
<th>Short term and long term goals (e.g., “What would you like to achieve?”)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reality</td>
<td>The current situation (e.g., “What have you tried so far?”)</td>
</tr>
<tr>
<td>Options</td>
<td>Alternative strategies or courses of action (e.g., “What could you do?”)</td>
</tr>
<tr>
<td>What</td>
<td>What is to be done (e.g., “What will you do after this conversation?”)</td>
</tr>
</tbody>
</table>
Sport Science
ISSF National Coach (first level)

Contents
Chapter 1 – Motivational climate
Chapter 2 – Performance profiling
Chapter 3 – Goal setting
Chapter 4 – Communication
Chapter 5 – Instructions and feedback
Chapter 6 – Principles of physical training
Verbal instructions

- Amount - Accuracy - Verbal cues

• Cues should clearly direct the learner’s attention to the critical aspects of a skill or of environmental factors

• Cues should contain only a few words

• Cues should contain “action words” that indicate what a performer must accomplish

• Cues should be precise and include quantitative information when appropriate

• Additional cues can be added as learning progresses

• Learners should be encouraged to repeat cues sub-verbally when they execute

• Cues should be repeated frequently, especially in
Visual information

- Use novices for demonstration
- Supply learners with the model’s feedback
- Use models similar to observers
- Use members of a group as learning models
- Use peer teaching
- Mix novice and expert demonstrations
- Provide demonstrations before and during practice
- Use effective view angles
- Use the correct speed
Feedback

• Use constructive feedback
• Reward successful approximations
• Reward performance
• Reward effort
• Use questioning
• Use appropriate timing and frequency
Cognitive Phase of Learning

Instructions & feedback

- Facilitate the athlete’s development of a basic movement pattern by clearly communicating the critical aspects of the skill
- Verbal cues short and precise
- Visual information
Instructions & feedback

- Focussed on the movement pattern and on the proprioceptive feelings while performing the skill.

Autonomous Phase of Learning

Instructions & feedback

- Help athletes maintain their level of skill and motivate them to further improve.
Monitoring Specific Behaviours

- Direct observation
- Behavioural checklists
- Athlete self-monitoring
- Videotape of practice and competition
- Post-performance evaluation
Error Correction

- Compare current execution with correct execution
- Select which error to correct—only one at a time
- Identify the cause(s) of the error and what to do to correct it
Feedback can create dependency

Frequent feedback for a long period of time can lead to dependency.

To prevent dependency

Faded Feedback

High
Gradually reduced (faded)

Feedback

Low skill level
High skill
To prevent dependency

Bandwidth Feedback

Incorrect execution: feedback provided
Correct execution: no feedback provided
Incorrect execution: feedback provided

Summary Feedback

Trial 1 | Trial 2 | Trial 3 | Trial 4 | Trial 5 | Trial 6 | Trial 7 | Trial 8 | Trial 9

Feedback | Feedback | Feedback

58
### Feedback in the Learning Process

<table>
<thead>
<tr>
<th>Cognitive stage</th>
<th>Associative stage</th>
<th>Autonomous stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedback is fundamental</td>
<td>Faded, bandwidth, or summary feedback</td>
<td>Feedback withdrawal</td>
</tr>
</tbody>
</table>
Contents

Chapter 1 – Motivational climate
Chapter 2 – Performance profiling
Chapter 3 – Goal setting
Chapter 4 – Communication
Chapter 5 – Instructions and feedback
Chapter 6 – Principles of physical training
Health-related fitness

Physical capacities that contribute to health: cardiorespiratory endurance, muscular strength, muscular endurance, flexibility, and body composition.

Cardiorespiratory endurance

The ability to perform prolonged dynamic exercises, involving large muscles, at moderate to high intensity levels.

Muscular strength

The amount of force a muscle can produce with a single maximum effort.
Muscular endurance
The ability of a muscle to contract or contract repeatedly over a long period of time.

Speed
The ability to perform a movement in a short period of time.

Flexibility
The ability to move the joints through their full range of motion.

Power
The ability to exert force rapidly, based on a combination of strength and speed.
Reaction and movement time
The ability to respond and react quickly to a stimulus.

Coordination
The ability to perform motor tasks accurately and smoothly using body movements and the senses.

Balance
The ability to maintain equilibrium while moving or while standing still.

Agility
The ability to change the position of the body quickly and accurately.
Adaptability to Individual Differences

Individual characteristics

- Initial fitness level
- Previous experience
- Age
- Gender
- Goals
- Motivation

**IMP.:** Customize the training programme according to the performer’s needs and abilities.
Main principles of physical training

- **Specificity**
- **Progression**
- **Overload** (Frequency, Intensity, Time, Type)
- **Recovery**
- **Tedium**
Specificity

...is needed to train the right:

- muscles
- type of fitness – endurance, strength, flexibility, balance… a combination of…
- skills – specific shooting techniques

Individuals respond differently to the same exercise or training load. Training must be adapted to meet the needs of the athlete.
Progression

• When the organism adapts, the overload must be increased to make training more difficult

• This implies gradually increasing the amount, frequency, intensity, and duration of the exercise
Overload

To improve it is necessary to apply greater demands on the organism

Four ways to achieve overload

- **Frequency** – how often
- **Intensity** – how hard
- **Time** (or duration) – how long
- **Type** – kind of training
The organism adapts to a specific training stimulus over time until a plateau is reached.

Changes in training and recovery periods are needed to continue progressive loading.

To enable recovery, training sessions must alternate between heavy, light, and moderate.
Exercise & Recovery

Workout

Initial level of preparedness

Depletion

Restitution

Supercompensation

Time
Different training loads have different effects on the athlete’s recovery.
Exercise & Recovery

The intervals are optimal and the subsequent workouts match with the supercompensation phase.
Exercise & Recovery

The intervals are too long and there is no stable training effect.
The intervals are too short and the level of athlete preparedness decreases due to accumulated fatigue.
Tedium

• It is important to vary training to prevent boredom
• Training should be enjoyable
• Variety is the key – Include a variety of training methods and vary the type of activity