



ISSF

International Shooting Sport Federation

ISSF

National Coach (first level)



SPORT SCIENCE

Sport Science

ISSF National Coach (first level)

Contents

Chapter 1 – Motivational climate

Chapter 2 – Performance profiling

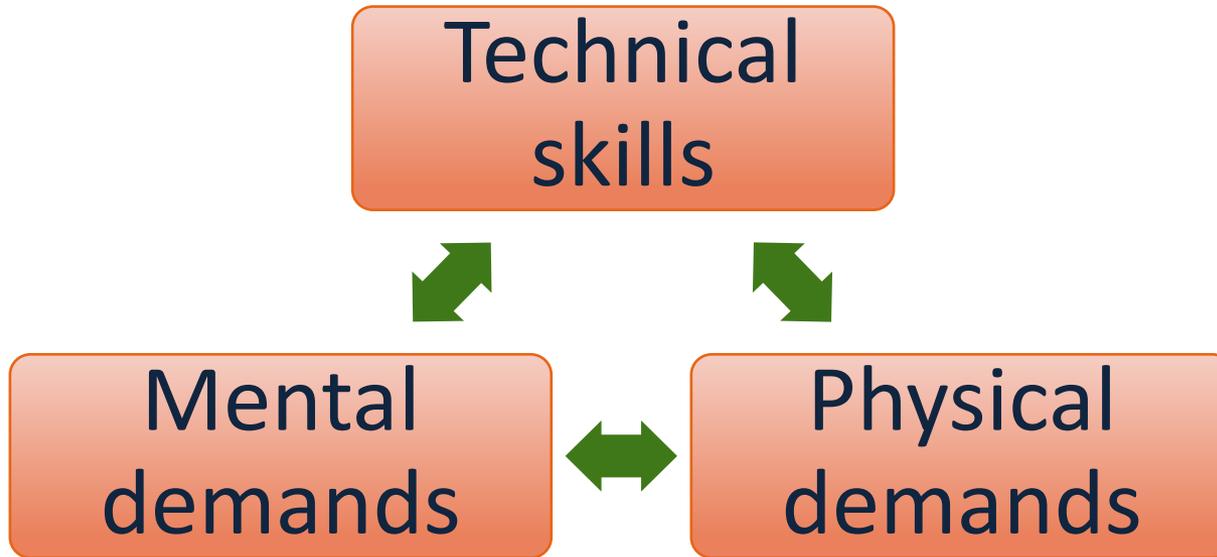
Chapter 3 – Goal setting

Chapter 4 – Communication

Chapter 5 – Instructions and feedback

Chapter 6 – Principles of physical training

Knowledge About your *Sport*



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

Motivation

(Modified from Weinberg & Gould, 2019)

Personal factors

- Personality
- Needs
- Interests
- Goals

**Personal/
situational factors**



Individual motivation

Situational factors

- Coach style
- Facility attractiveness
- Sport achievements

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

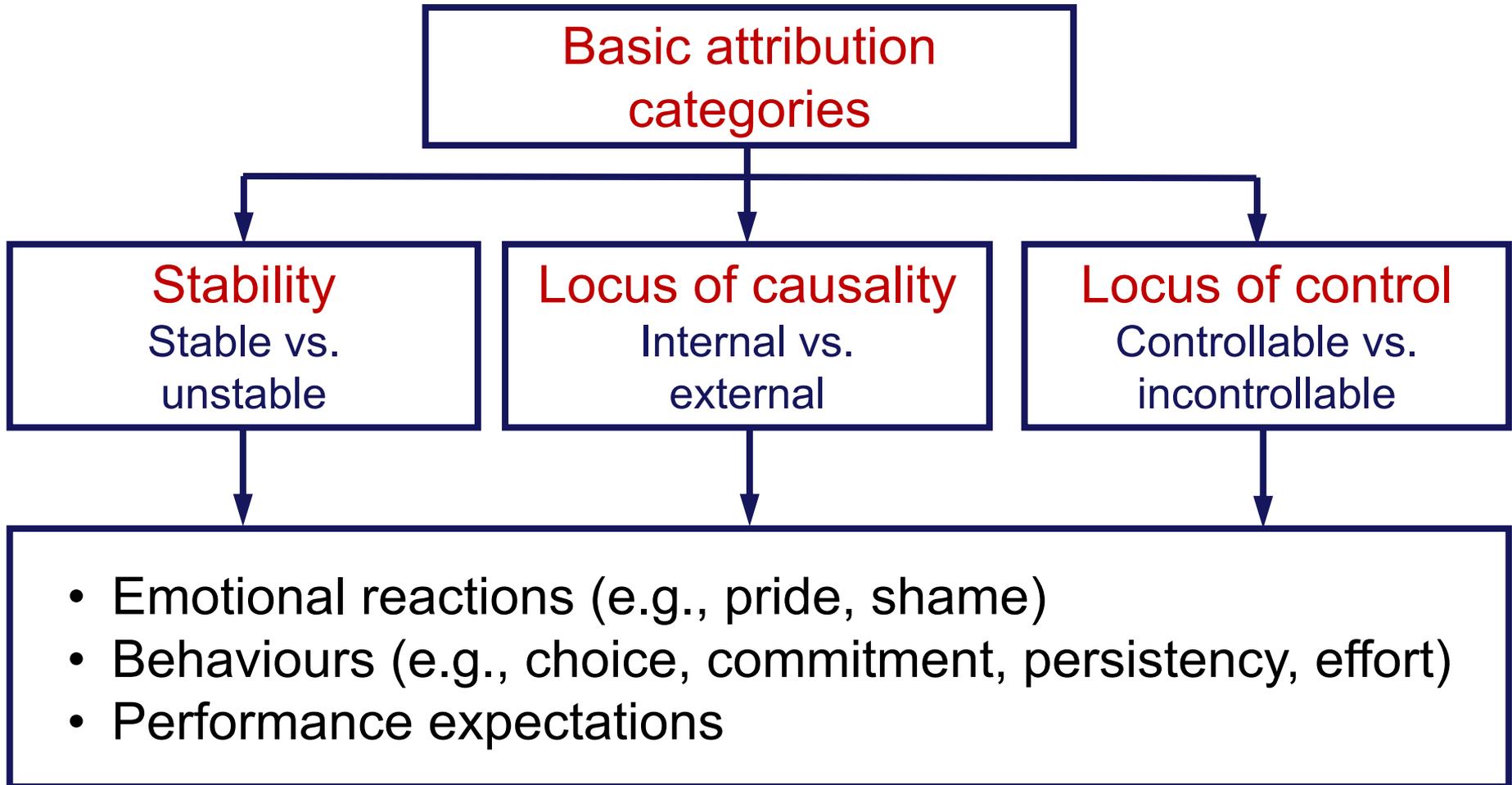
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graph TD; A[Three main theories of motivational processes] --- B[ ]; B --- C[attribution]; B --- D[achievement goal]; B --- E[self-determination];
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attribution

achievement
goal

self-
determination

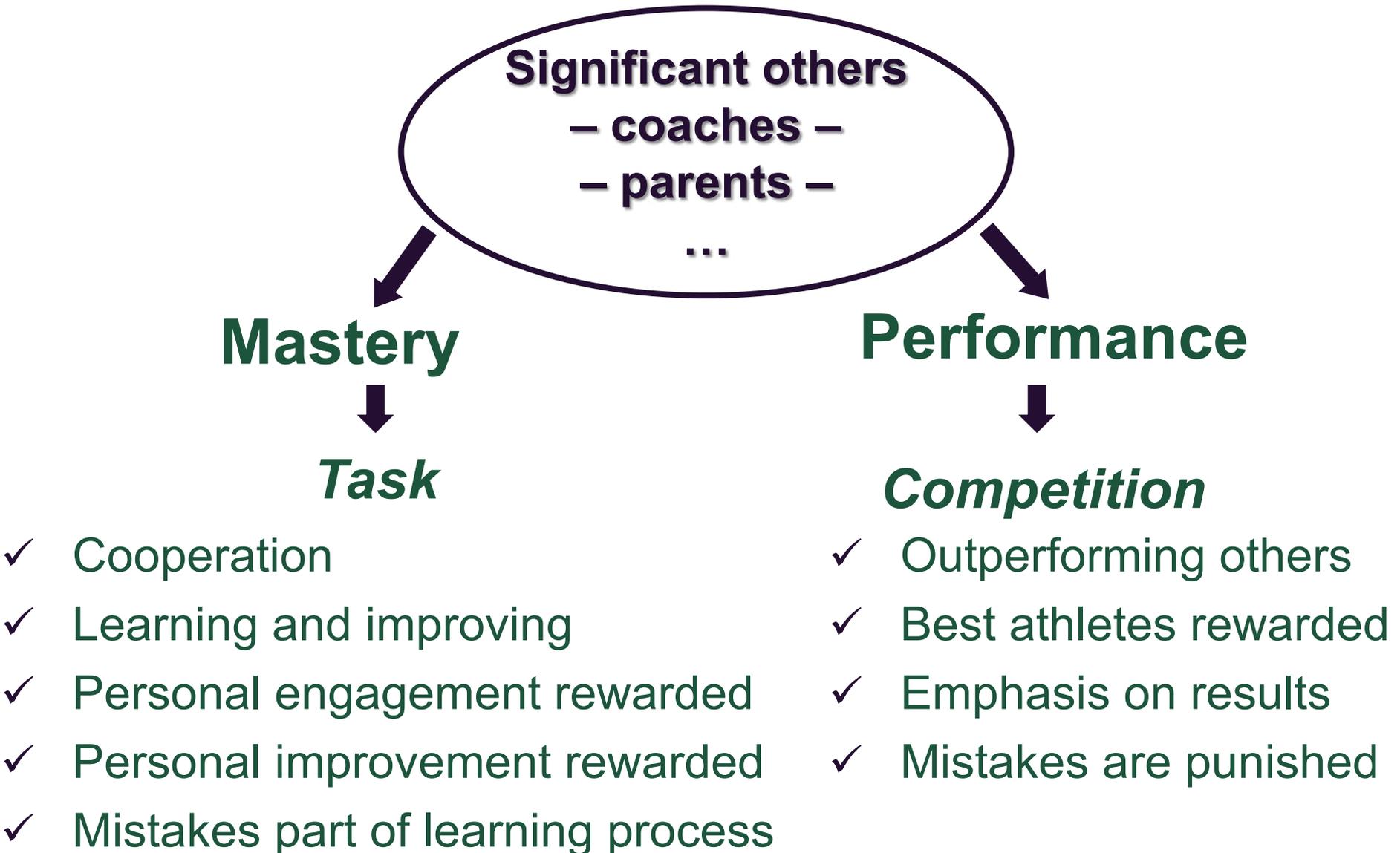
Attribution Theory



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



Achievement Goal Theory

Skills development through

- T**ask Varied and challenging
- A**uthority Responsibility and independence for learning
- R**ecognition Personal recognition for accomplishments
- G**rouping Cooperative learning and peer interaction
- E**valuation Based on mastery of tasks and improvement
- T**ime Time requirements attuned to individual abilities

Self-determination theory

**Coach
behaviour**

**Basic
psychological
needs**

- *autonomy*
- *competence*
- *relatedness*

**Intrinsic
motivation**

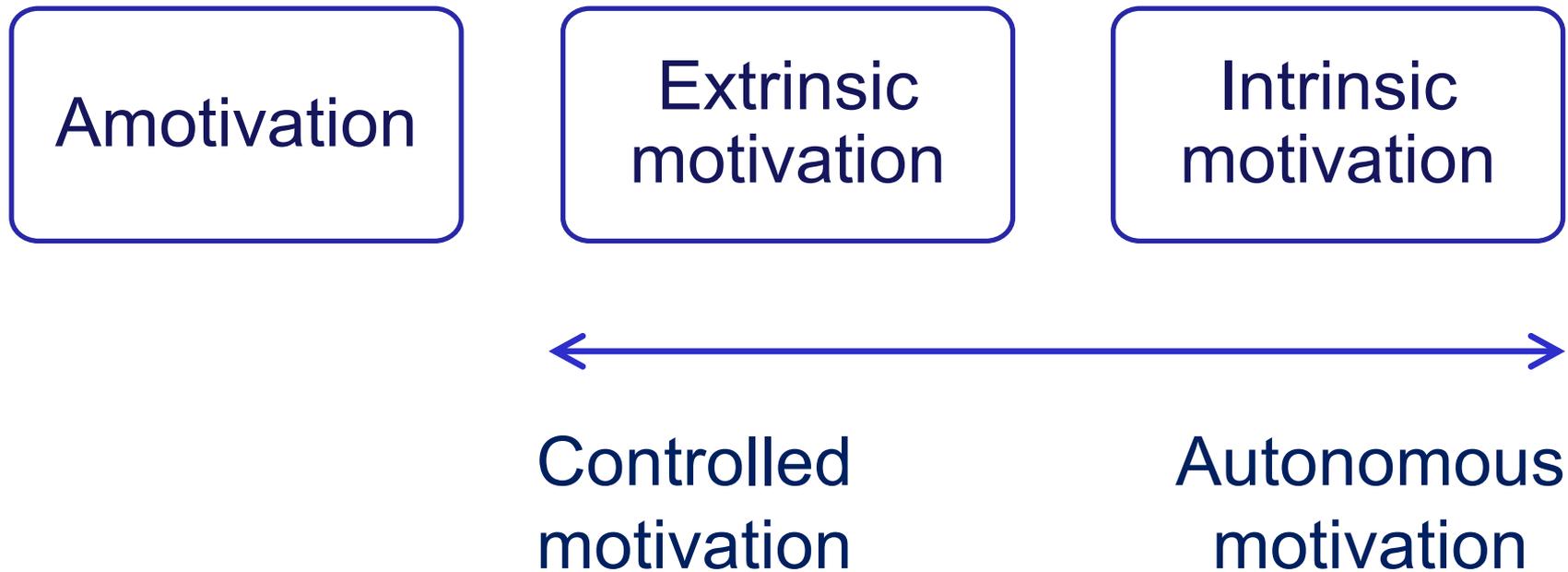
- *knowledge*
- *accomplishment*
- *stimulation*

Adaptive outcomes

- *autonomous behaviour*
- *engagement*
- *persistence*
- *enjoyment*
- *well-being*
- *optimal functioning*
- *sportsmanship*

.....

The self-determination continuum



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

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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)

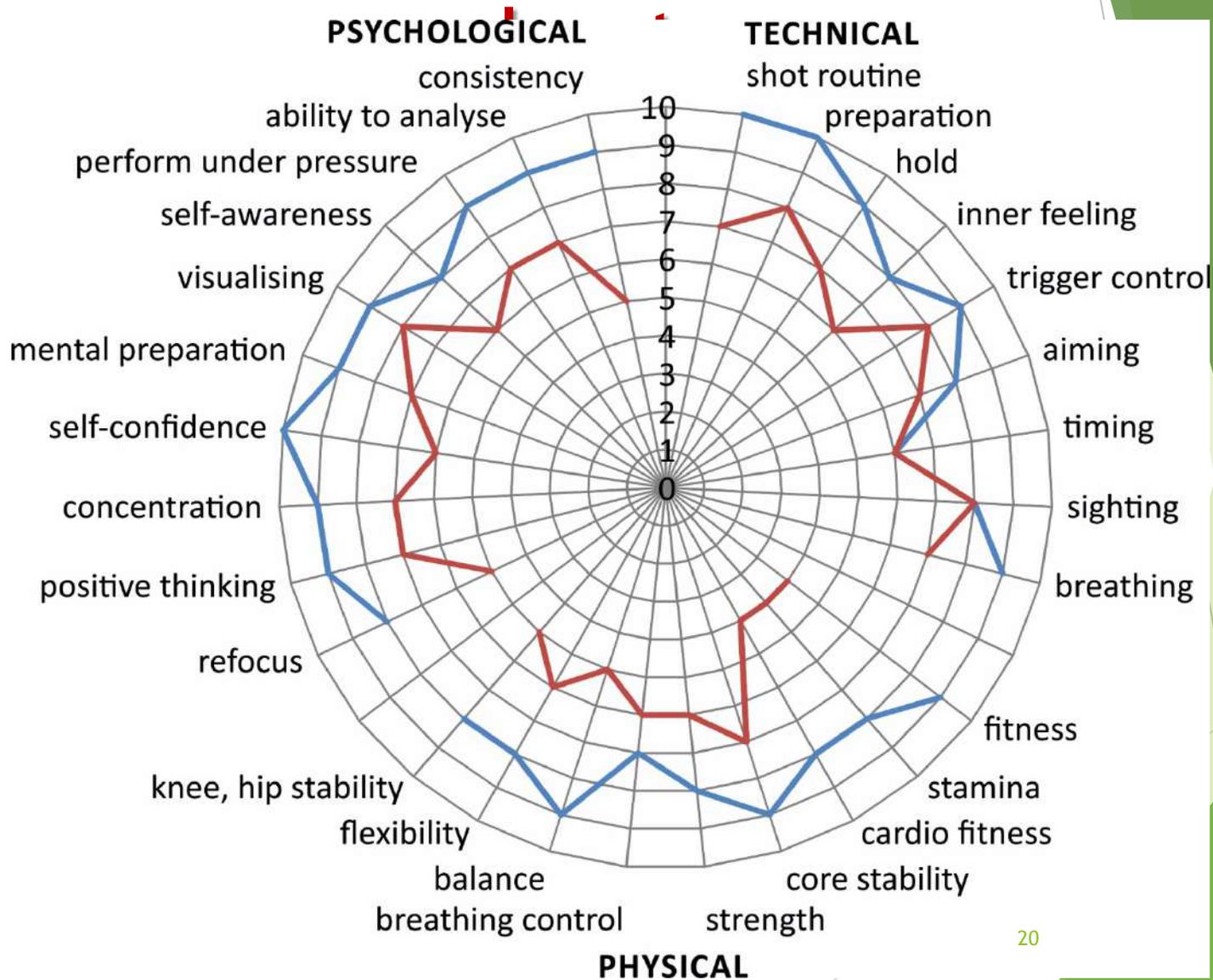
Proposed solution

- 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



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

Performance Profiling (2/2)

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

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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



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Communication

- ▶ 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

Communication

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

Communication

Sending Messages Effectively (2/4)

- ▶ 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

Communication

Sending Messages Effectively (3/4)

- ▶ 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

Communication

Sending Messages Effectively (4/4)

- ▶ 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

Communication

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

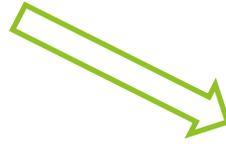
The “Sandwich Approach” to Giving Feedback

- ▶ 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



Communication

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)

Goal

- Short term and long term goals (e.g., “What would you like to achieve?”)

Reality

- The current situation (e.g., “What have you tried so far?”)

Options

- Alternative strategies or courses of action (e.g., “What could you do?”)

What

- What is to be done (e.g., “What will you do after this conversation?”)

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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
level

High skill

To prevent dependency

Bandwidth Feedback

Incorrect execution: feedback provided

Correct execution: no feedback provided

Incorrect execution: feedback provided

Summary Feedback



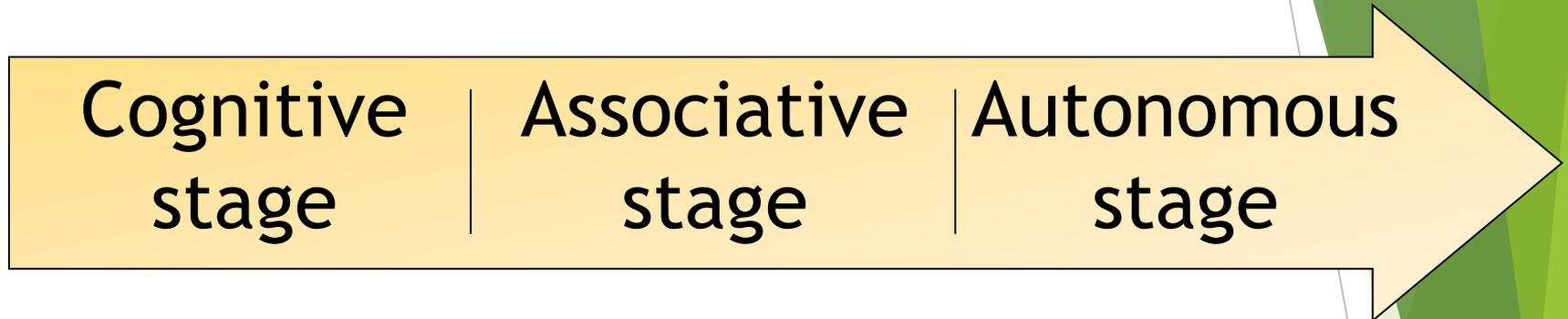
Feedback

Feedback

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Feedback

Feedback in the Learning Process



Cognitive stage

Feedback is fundamental

Associative stage

Faded, bandwidth, or summary feedback

Autonomous stage

Feedback withdrawal

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Definition of key terms (1/3)

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.

Definition of key terms (2/3)

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.

Definition of key terms (3/3)

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 (**F**requency **I**ntensity **T**ime **T**ype)

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

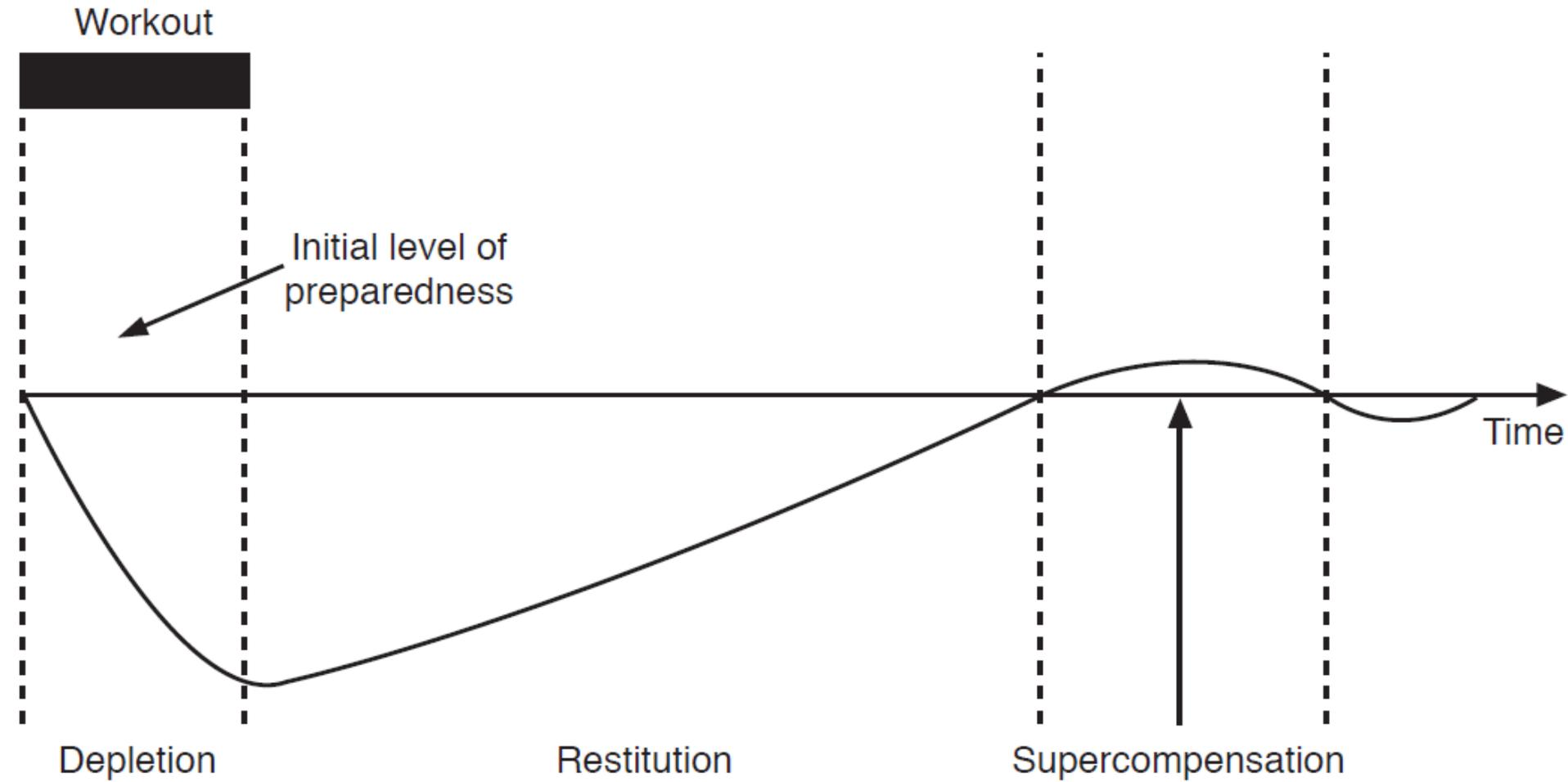
Four ways to achieve overload

- **F**requency – how often
- **I**ntensity – how hard
- **T**ime (or duration) – how long
- **T**ype – kind of training

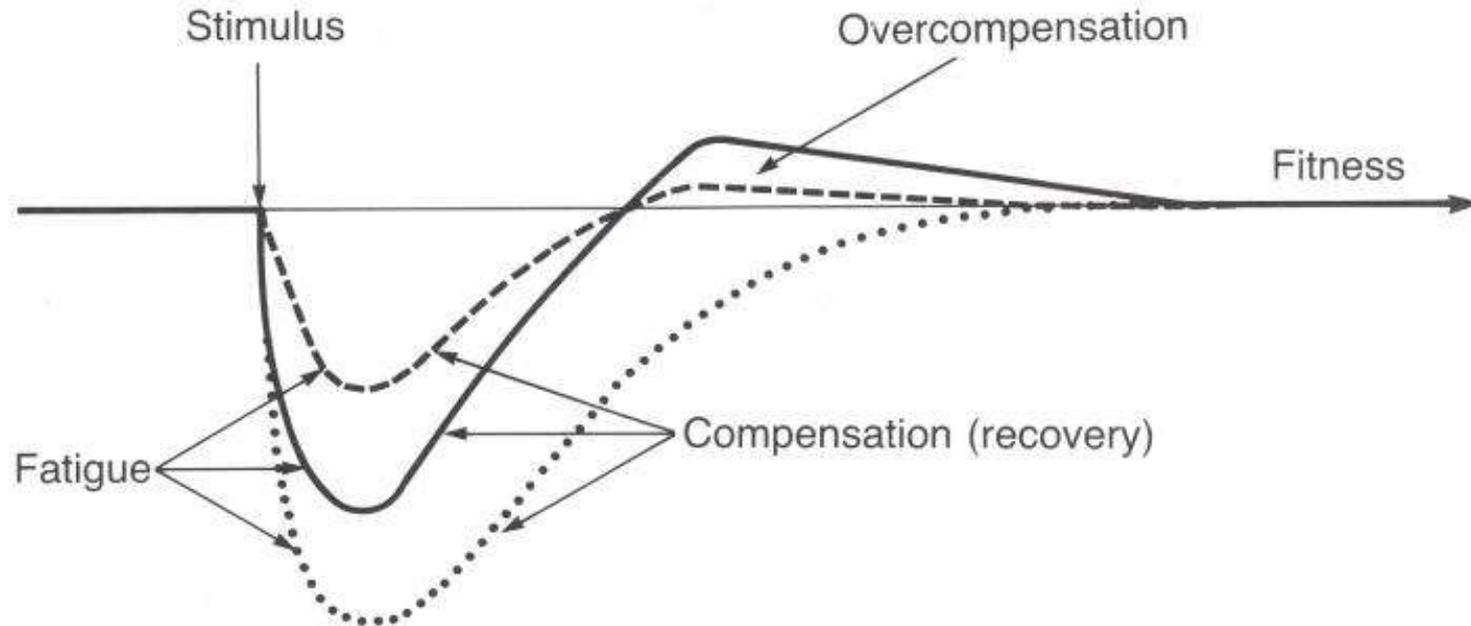
Recovery

- ▶ 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



Exercise & Recovery

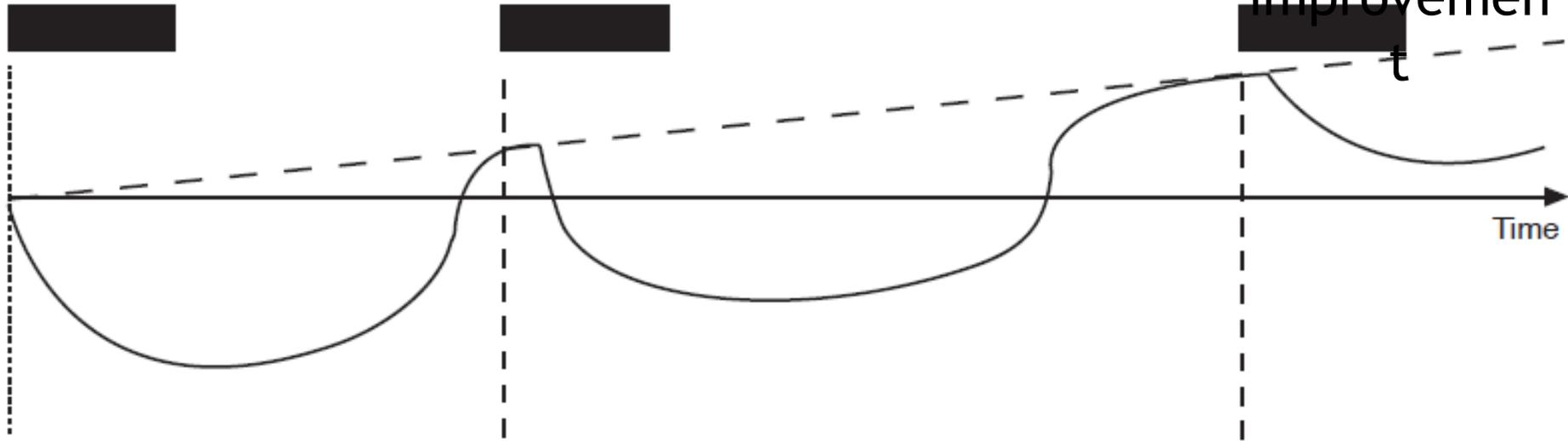


KEY

- Training too easy
- Training adequate
- Training too hard

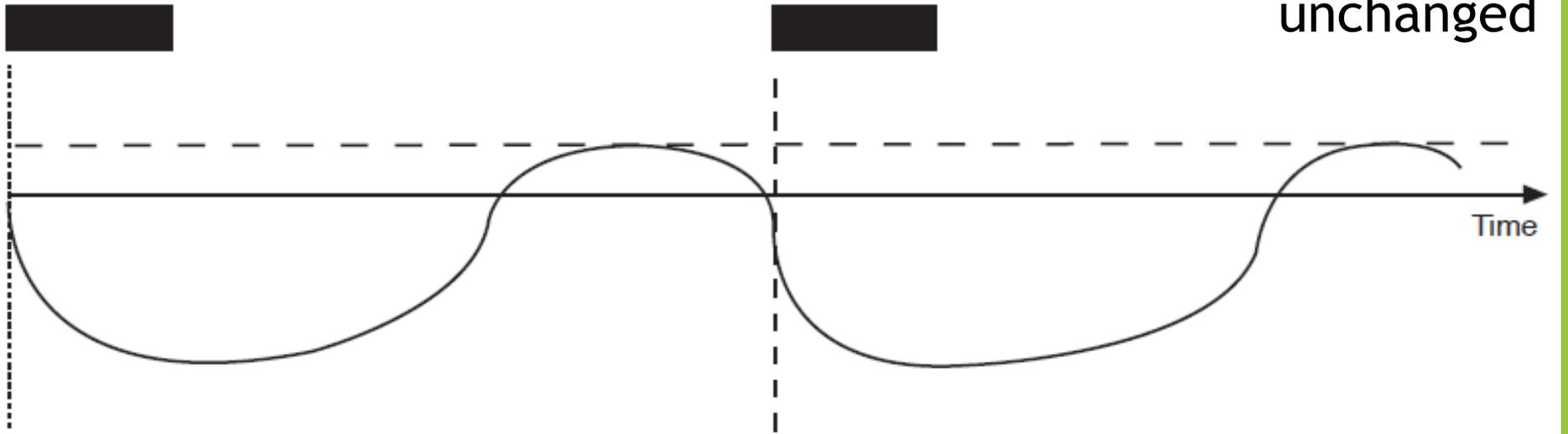
Different training loads have different effects on the athlete's recovery

Exercise & Recovery



The intervals are optimal and the subsequent workouts match with the supercompensation phase

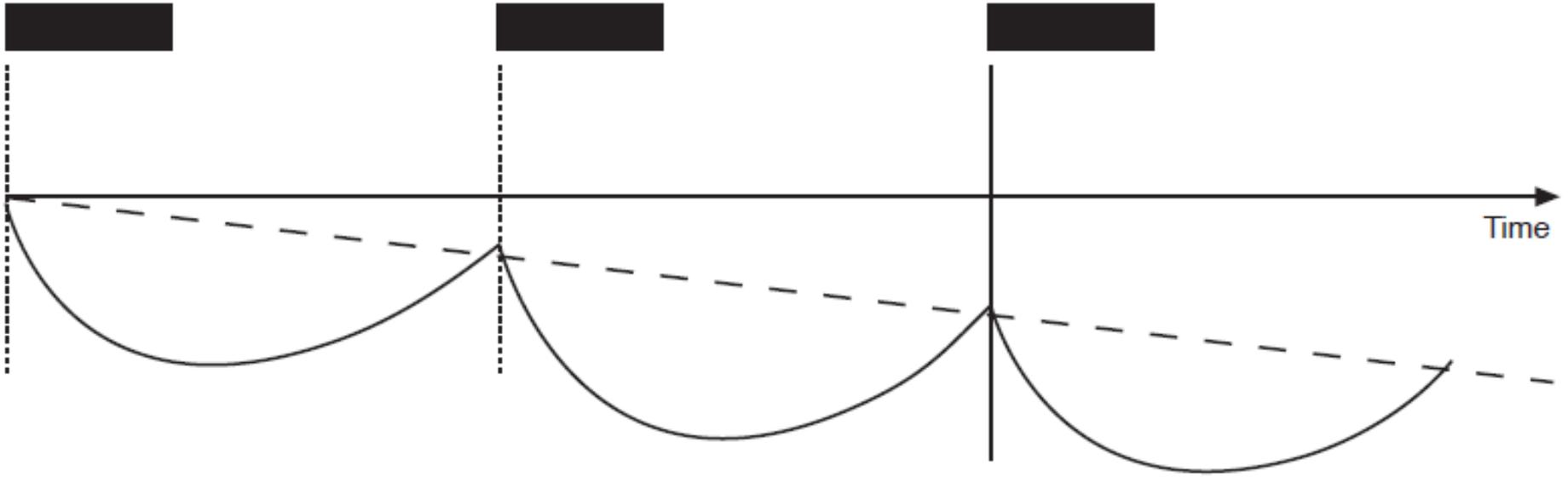
Exercise & Recovery



The intervals are too long and there is no stable training effect

Exercise & Recovery

Performance decrease



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