PRINCIPLES OF DISTANCE TRAINING

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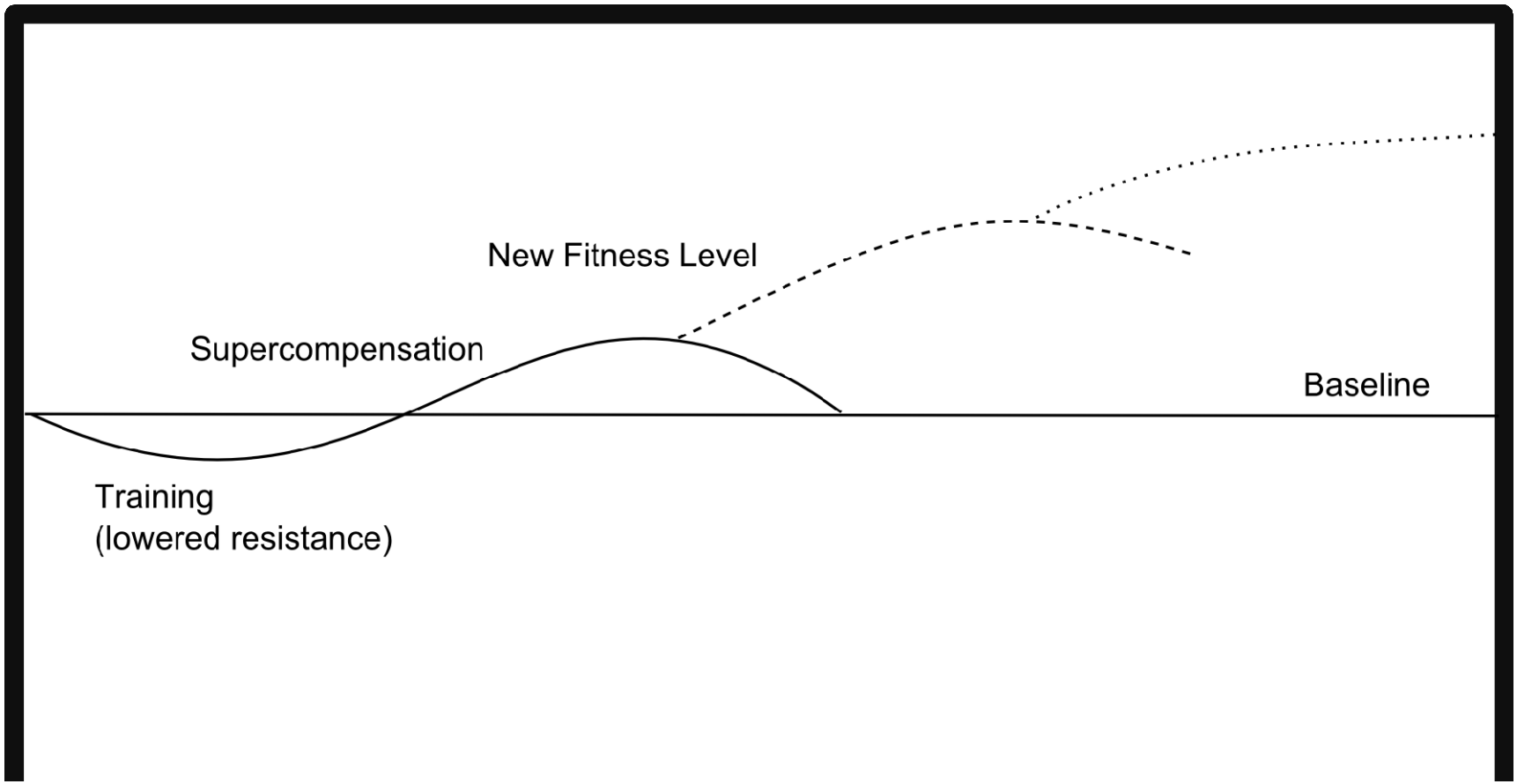
How does Adaptation work?



Fitness-Fatigue Model

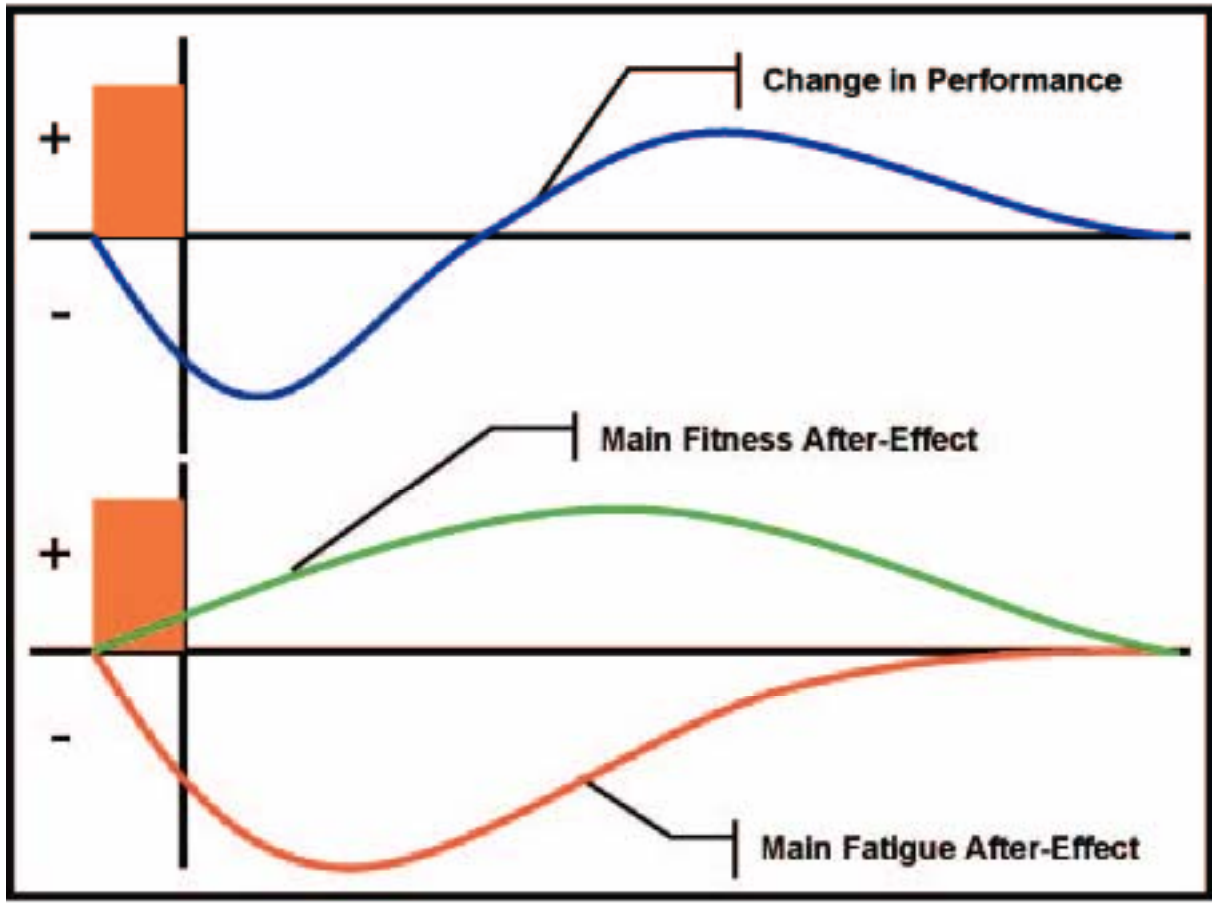
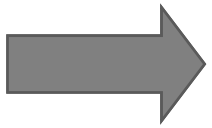


Figure 1. Fitness-fatigue theory.

Training Stimulus  **Adaptation**

GIVEN adequate recovery and nutrition

Assumptions made:

- 1. We assume that the person follows a normal route of adaptation.
- 2. We assume that the recovery is correct and long term adaptation takes place.

Questions Need Answering?

- 1. What is the training adaptation we are looking for?
- 2. What stimulus leads to that adaptation?
- 3. How much is enough?

What a coach needs to know:

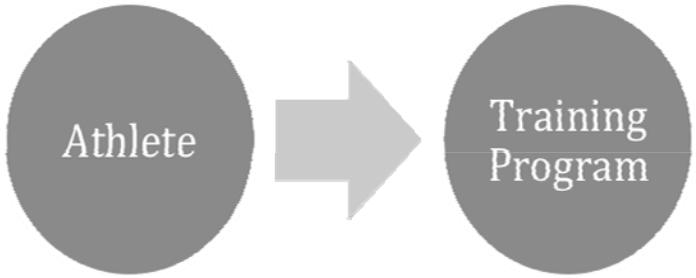
- What **ADAPTATIONS** are needed for your athlete training for your event and individual athlete.
- How much **STIMULUS** (volume, intensity, density, etc.) needs to be applied for your individual athlete.
- How much **RECOVERY** and what type of training can be done while the athlete adapts.
- **TIMING**- At what period and how often should the athlete be working on these adaptations.

Advanced understandings:

- What external factors can influence adaption (nutrition, recovery, physio, timing, etc.)
- Interactions between confounding adaptations.
- Amplifiers and Dampeners of adaptation process.

Knowing the Adaptation

- **Traditional Model**

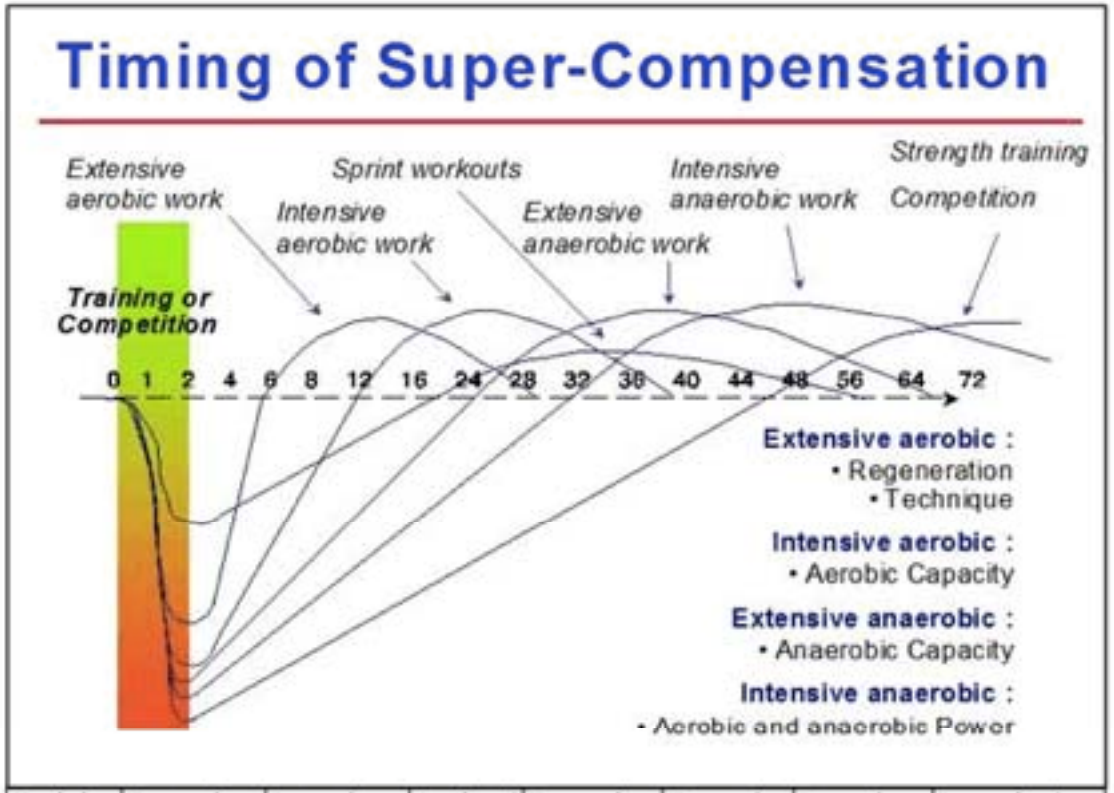


- **Athlete Centered Model**

Stimulus

- WHAT is the goal of the workout?
- What are we trying to accomplish?
  - Speed
  - Endurance
  - Aerobic/Anaerobic
  - Tolerance? Fatigue? Neuromuscular development

Recovery



Training types	Extensive Endurance	Intensive Endurance	Sprints/ Short Sets	Extensive Anaerobic Training	Extensive Strength Training	Intensive Anaerobic Training	Intensive/ Strength Training/ Competition
From	8	24	30	36	40	40	48
To	12	30	40	48	60	60	72

Source: Jan Olbrecht, *Science of Winning*

TIMING

- How long to develop?
- Periodization
- When do we need to reach peak phase for each component?
  - Speed/anaerobic
  - Endurance/aerobic
  - Specific endurance
  - Whatever it is your trying to develop!

Workout Specifics

- Step 1: Adaptation and Direction
  - What adaptation are we trying to get?
  - What direction are we trying to take it?
    - Endurance?
    - Speed?
    - Strength?

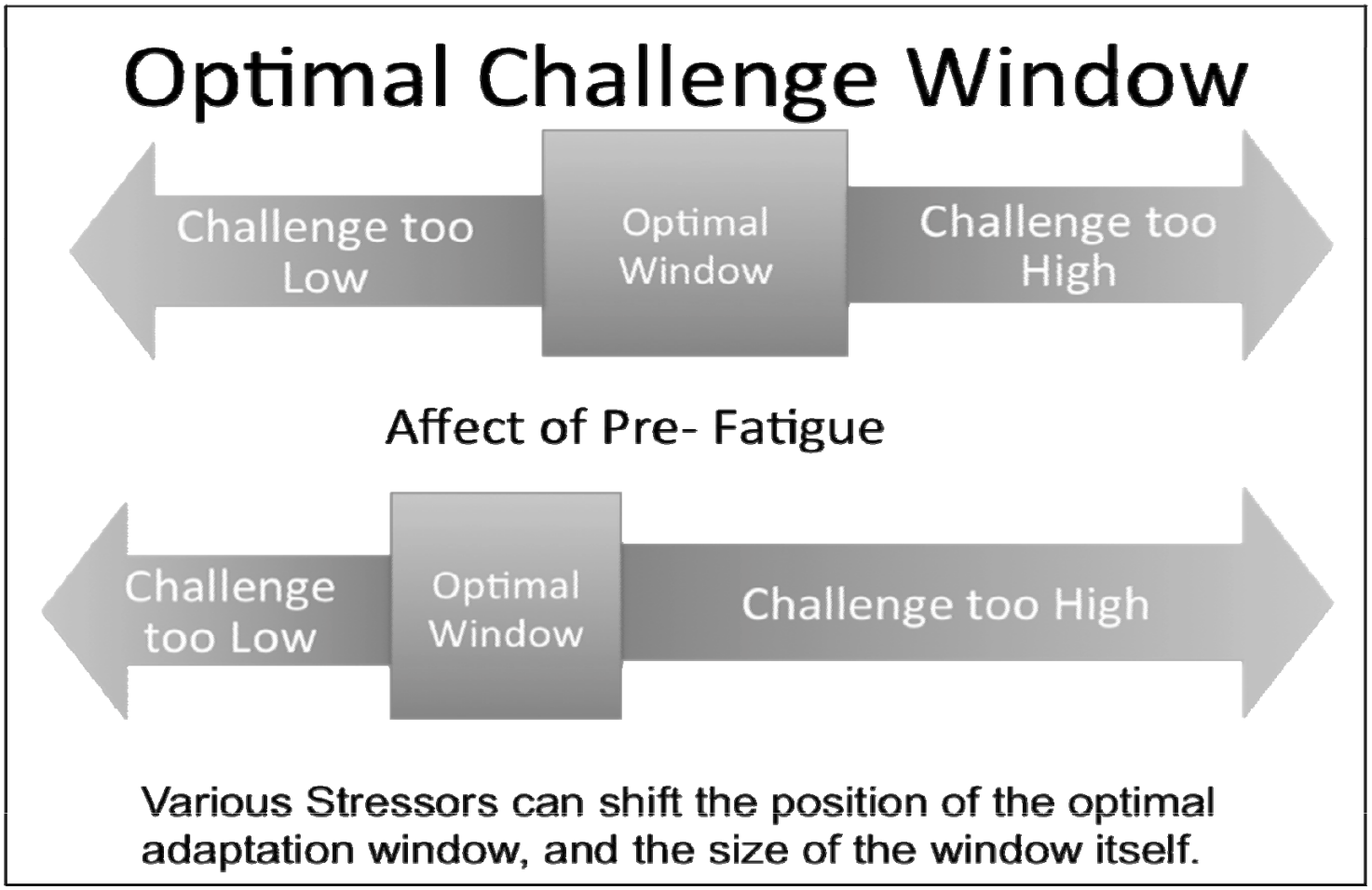
Step 2: Build or Maintain-

- Are we trying to improve a quality or maintaining it?
  - Build? Press the boundaries
  - Maintain- do about 75% of workload
  - Example: During Base, trying to build endurance
    - So might lengthen tempo run from 10min to 15min to 20min and then speed up.
    - During Competition season:
      - That 25min at 5:30 pace, may become, 15min at 5:30 pace to maintain

Step 3: Degree of overload

- How much are we trying to improve a quality?
  - Go big or go home?
  - Gradual?
    - Ex: If we have an athlete who can do 4x400 at goal 800m pace of 57 with 5min rest
      - Go big? Try 6x400 at same pace or 4x400 in 55 with 4min rest
      - Gradual? 5x400 in 57 with 5min rest OR 4x400 in 56
  - *Recovery should be proportional to stress

How challenging?



Workout Creation

If we start here:

4:06 miler. Able to do 8x400 in 62 with 60sec rest

How do we get here:

4:00 miler

Capable of doing 8x400 in 59 with 60sec rest

Workout Creation

- **How do we adjust workouts?**
- **The "typical" list most people use:**
  - Rep distance
  - Total volume
  - Rest between interval
  - Speed

Workout Variables to Manipulate

- Speed
  - Within reps, workout
- Recovery
  - Length (between reps, between sets)
  - Standing/jogging/steady/with "stuff"
- Rep length
- Terrain
  - Hill, soft, hard, variable, etc.
- Volume (total/sets)
- Density
- "Stuff"
  - Aerobic/clearing
  - Sprint
  - Strength
- Surges
- Feedback manipulators
  - Knowledge of splits, reps, distance of reps, total workout, terrain, etc.

What do they do?

- Speed- Tolerance
- Recovery
  - Length (between reps, between sets)----
  - Standing/jogging/steady/with "stuff"----
- Rep length----- speed endurance (Can last same speed for longer)
- Terrain- Add strength or stability component/ strength endurance
  - Hill, soft, hard, variable, etc.
- Volume (total/sets)- Capacity/ endurance
- Density- Recoverability/Capacity
- "Stuff"
  - Aerobic/clearing
  - Sprint
  - Strength
- Surges- Race prep/
- Feedback manipulators- Central Fatigue/Emotion of fatigue
  - Knowledge of splits, reps, distance of reps, total workout, terrain, etc.

- Example:
  - 1st workout- 6x800 with 90sec rest at 75 sec/lap
  - Option A- endure- 6x900 with 90sec rest at 75sec/lap
  - Option B-recovery- 6x800 with 60sec rest at 75sec
  - Option C-speed- 6x800 with 90sec rest at 73/lap
  - Option D-tolerate- 6x800 with 90sec rest with 1st 200 in 34, then 38,38,37
  - Etc. etc. etc.

How do we get there?

Mile Specific- Race Pace work for a goal 4:00 mile

Top Down	Bottom Up	Alternations
(for goal of 60sec pace)	12x200 w/ 200m jog in 30sec	100m surge every 800m during a 3-4mile threshold segment
4x(4x400 w/ 30sec rest) at 64-65, 3min b/t sets	9x300 w/ 100m walk/jog in 45sec	Alternating 100m at mile pace, 400m steady/marathon pace for 2.5miles
3x(5x400 w/ 40sec rest) at 63-64 w/ 3min b/t sets	3x(400,300,200) w/ 60sec rest) w/ 3-4min b/t sets	Alternating 200m at mile pace, 200m easy for 2miles
12x400 at 63 w/ 60-75sec rest	4x200, 3x300, 2x400, w/ 60sec rest	Alternating 200m at mile pace, 200m at 10sec slower per 200m for 2 miles
2x(5x400 w/ 45sec rest) at 61 w/ 2min b/t sets	3x(500, 300 w/ 60sec rest) w/ 4min b/t sets	Alternating 300m at 1mile pace, 200m steady for 3,000m
10x400 at 61-62 w/ 60sec rest	2x(5x400 w/ 60sec rest) w/ 3-4min rest	Alternating 400m/100m (5x) w/ 400 at mile pace, 100m easy
10x400m at 60sec w/ 60sec rest	8x400 with 60sec rest in 59	
8x400 at 59sec with 60sec rest		

But…we need everything to surround it…

- In order to have the endurance to run 8x400 in 59, you have to be able to do… 6x800 in 2:08
  - In order to do 6x800, you have to….etc.
- In order to have speed to run 8x400s in 59, you've got to be able to run 300s in 42…and so on

- PERIODIZATION…
- Include everything from pure sprint to long runs…