THE PARABLE OF PERIODIZATION:

Resurrecting the Foundation of the Training Process

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Collective goals of periodization

1. Properly manage fatigue to minimize potential for overtraining & injury.
2. Maximize adaptations to training & positively alter physiology.
3. Maximize performance preparedness at predetermined timepoints.

1896-1930	1931-1950	1951-1990	1991-2018

Adapted from DeWeese et al., 2013 & Pedemonte, 1986

1896-1930	1931-1950	1951-1990	1991-2018
Optimization Through Organization		Multi-disciplinary Scientific Consideration	
Uninterrupted & Continuous Training		Sequential Hierarchy	
	Extensive → Intensive		

Adapted from DeWeese et al., 2013 & Pedemonte, 1986

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Optimization Through Organization		Multi-disciplinary Scientific Consideration	
Uninterrupted & Continuous Training		Sequential Hierarchy	
Cyclical & Phasic with Stages	Extensive → Intensive		
	General → Specific		

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1896-1930	1931-1950	1951-1990	1991-2018
Optimization Through Organization	Planned Variation & Restitution	Multi-disciplinary Scientific Consideration	
Uninterrupted & Continuous Training	Reduce Likelihood of Overtraining & Injury	Sequential Hierarchy	
Cyclical & Phasic with Stages	Extensive → Intensive		
Consideration of Individualized Response	General → Specific		

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Optimization Through Organization	Planned Variation & Restitution	Multi-disciplinary Scientific Consideration	
Uninterrupted & Continuous Training	Reduce Likelihood of Overtraining & Injury	Sequential Hierarchy	
Cyclical & Phasic with Stages	Extensive → Intensive	Workload Structure	
Consideration of Individualized Response	General → Specific	Scalability & Summation of Training Effects	

Adapted from DeWeese et al., 2013 & Pedemonte, 1986

1896-1930	1931-1950	1951-1990	1991-2018
Optimization Through Organization	Planned Variation & Restitution	Multi-disciplinary Scientific Consideration	Scientific Evolution & Evidence-based
Uninterrupted & Continuous Training	Reduce Likelihood of Overtraining & Injury	Sequential Hierarchy	
Cyclical & Phasic with Stages	Extensive → Intensive	Workload Structure	
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1896-1930	1931-1950	1951-1990	1991-2018
Optimization Through Organization	Planned Variation & Restitution	Multi-disciplinary Scientific Consideration	Scientific Evolution & Evidence-based
Uninterrupted & Continuous Training	Reduce Likelihood of Overtraining & Injury	Sequential Hierarchy	Context-specific Evidence
Cyclical & Phasic with Stages	Extensive → Intensive	Workload Structure	Forecast Training Needs & Responses
Consideration of Individualized Response	General → Specific	Scalability & Summation of Training Effects	Ongoing Athlete Monitoring

Adapted from DeWeese et al., 2013 & Pedemonte, 1986

1896-1930	1931-1950	1951-1990	1991-2018
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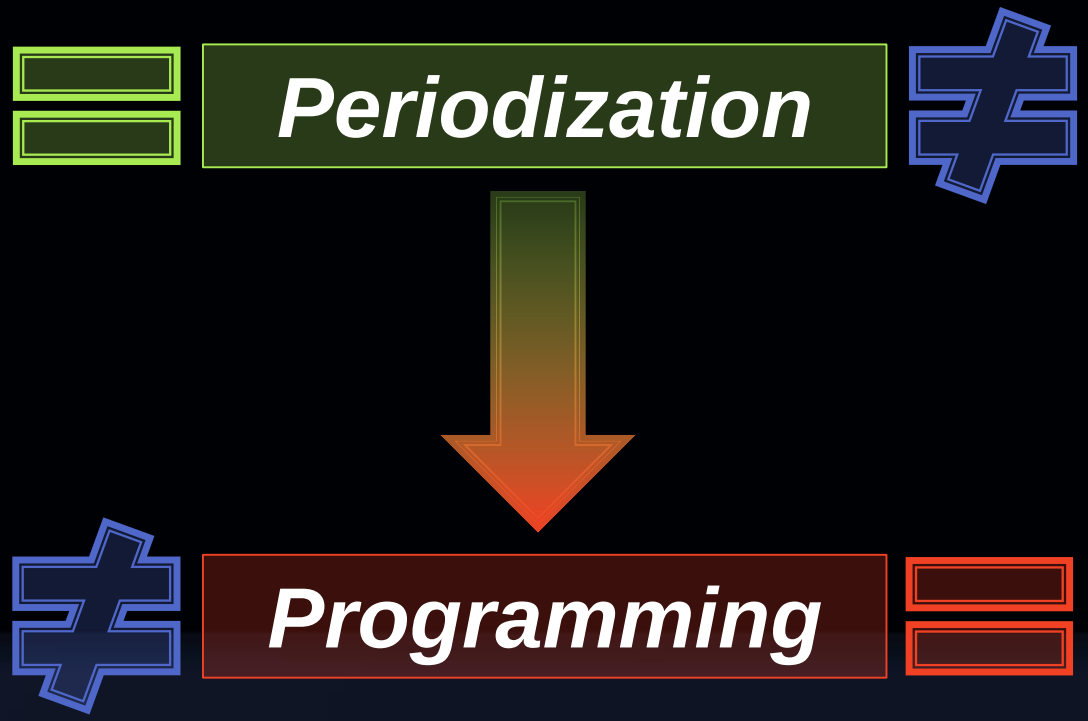
Consideration of Individualized Response	General → Specific	Scalability & Summation of Training Effects	Ongoing Athlete Monitoring

Adapted from DeWeese et al., 2013 & Pedemonte, 1986

Objectives:
Evidence-driven
Optimize performance
Manage fatigue
Prevent injury
Planned variation
General → Specific
Ongoing athlete monitoring

Timelines:
Lifetime (LTAD)
Quadrennial/Collegiate
Annual
Macrocycle
Mesocycle
Microcycle
Session

Phases:
GPP (Accumulation)
SPP (Transmutation)
Competition (Realization)
Active Rest



Strategies:
Phase potentiation
Planned overreaching
Tapering

Training Variables:
Frequency
Density
Volume
Intensity
Mode
Order
Sets
Repetitions
Rest interval
Recovery mode
Recovery duration

Figure from DeWeese, 2014

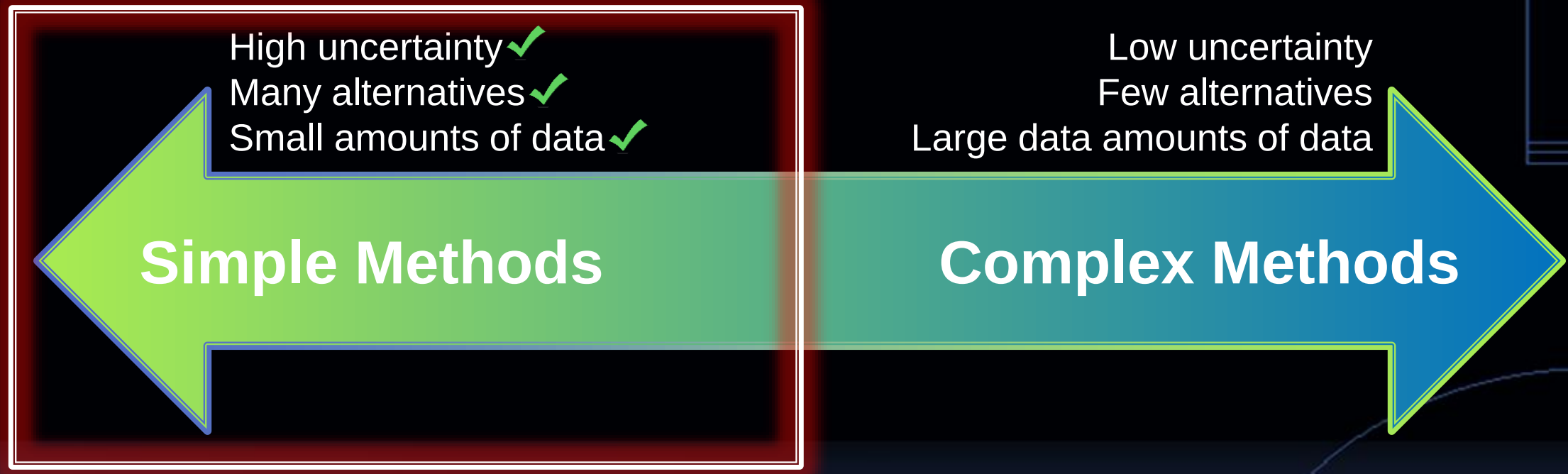
The death of periodization

“If there is one self-limiting tendency among strength and conditioning professionals, it is that we often focus on numerical models, rather than underlying strategy when designing programs…”

Plisk & Stone, 2003

Yuri Verkhoshansky, 2009

College athletics is complex

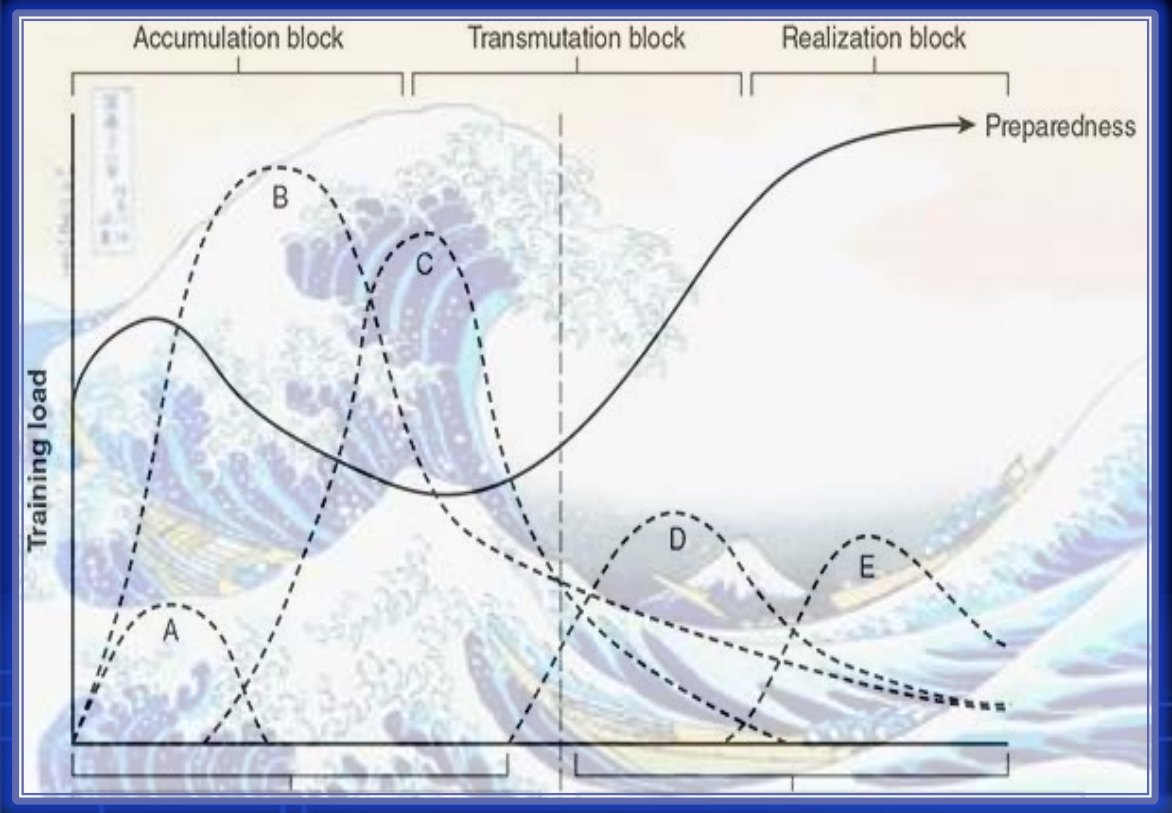


Adapted from Gigerenzer, 2015

Fractals & Physiology

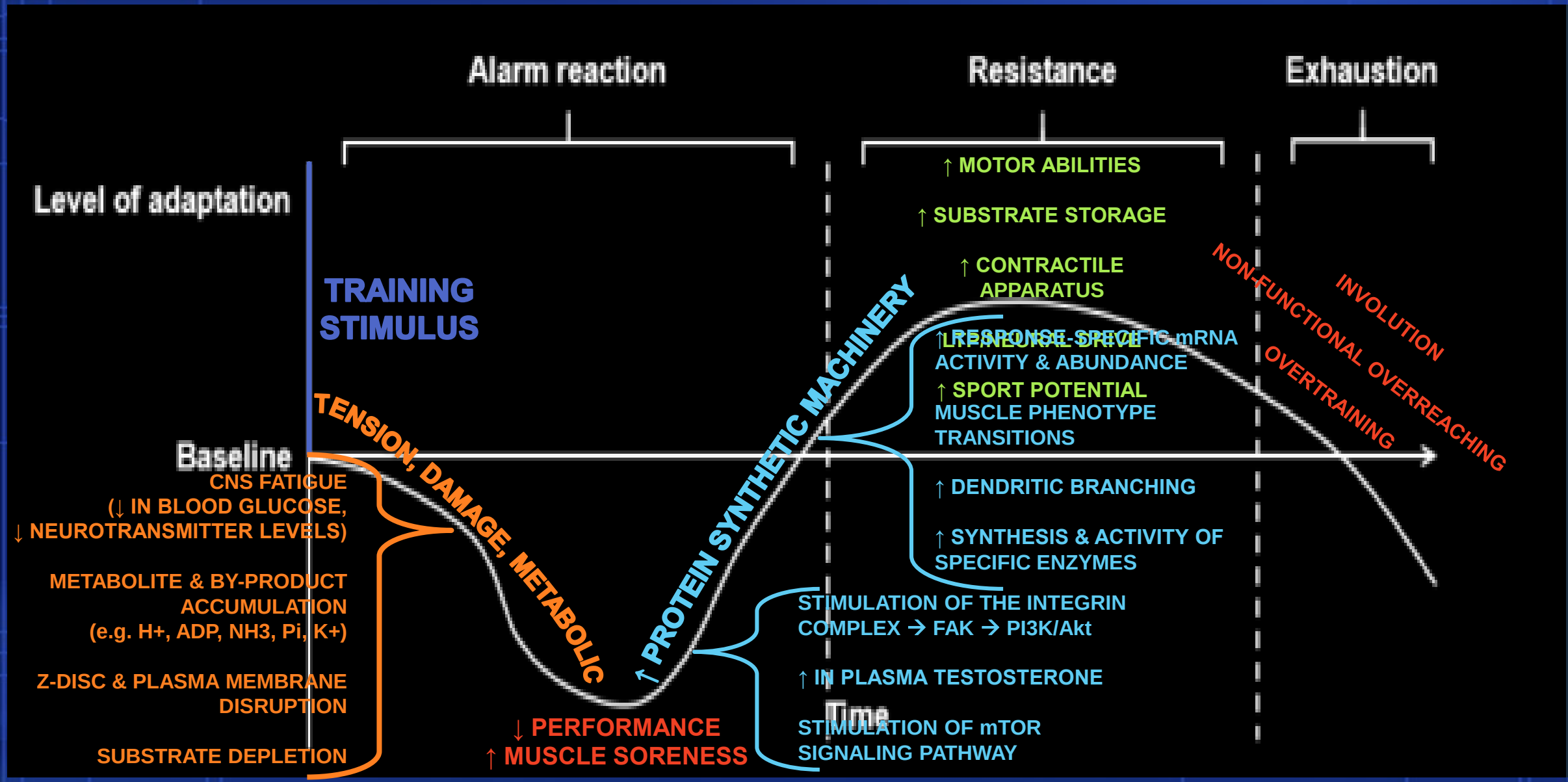
Exploiting physiology through systemic organization

Self-similarity & scalability of periodization

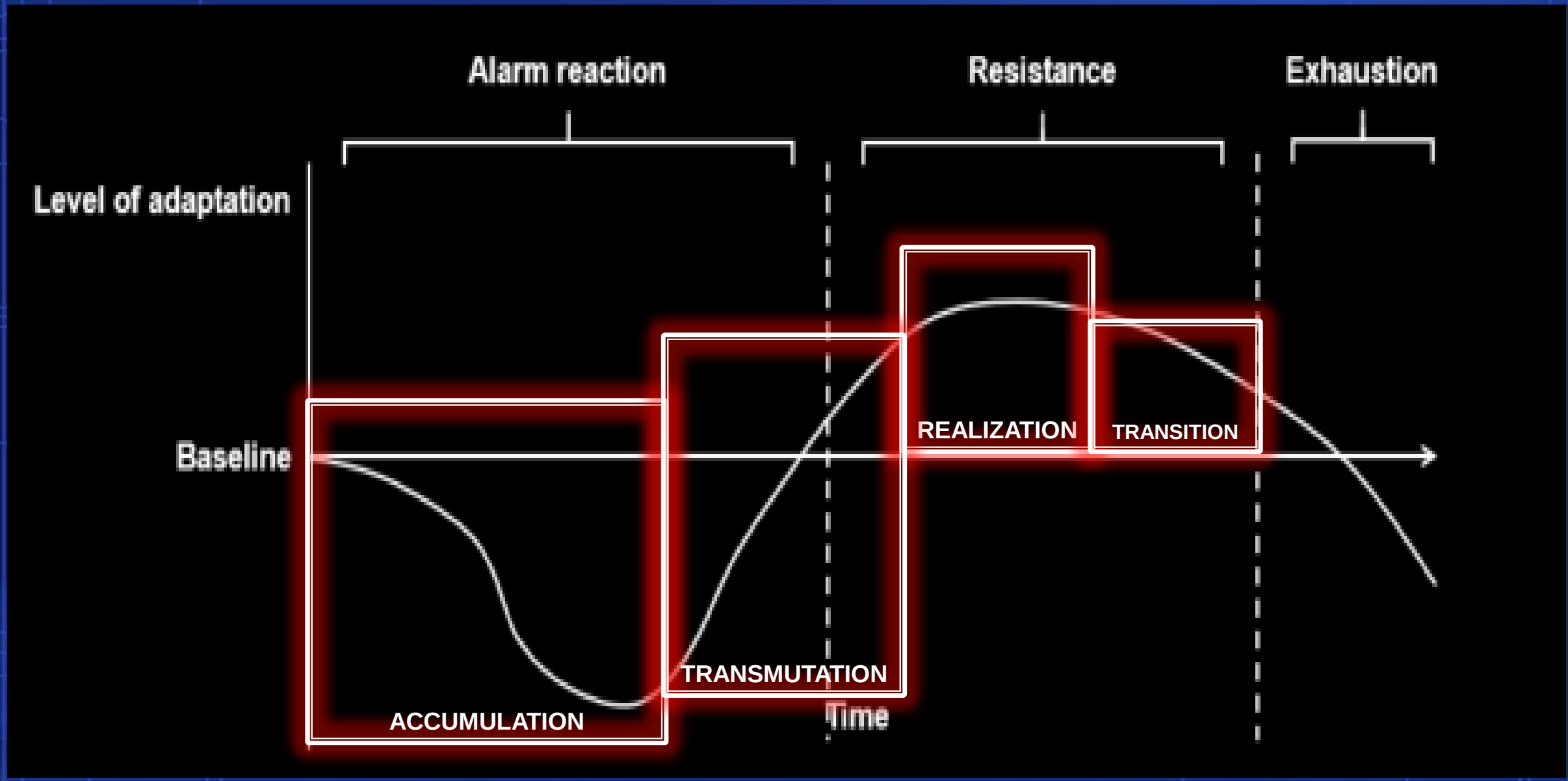


- Similar patterns recur at progressively smaller scales
- Fractal organization represents complex, adaptive systems
- Interrelatedness of numerous components at various scales increases overall functionality
- Systemic organization allows perturbations to be attenuated

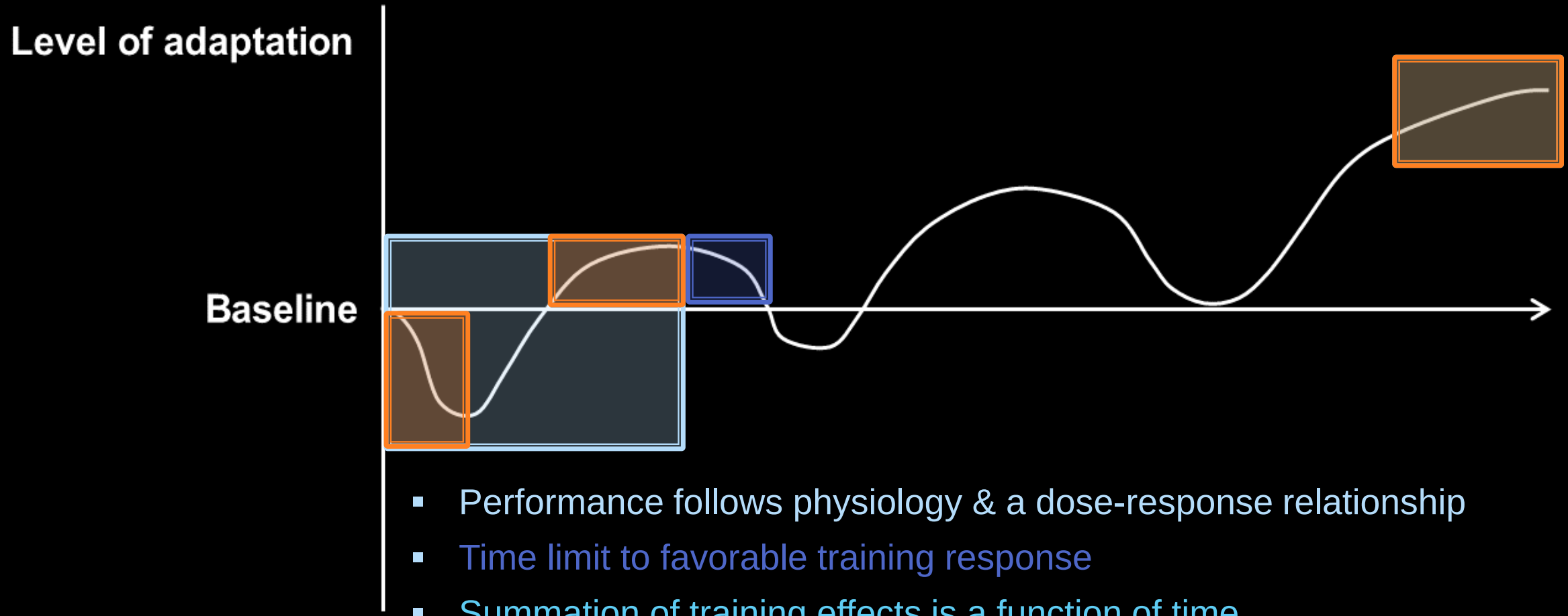
Figure adapted from Hokusai, Haff in Hoffman, 2012



Adapted from Cunanan et al., 2018, Selye, 1946, Viru, 1994



Adapted from Cunanan et al., 2018, Selye, 1946, Viru, 1994



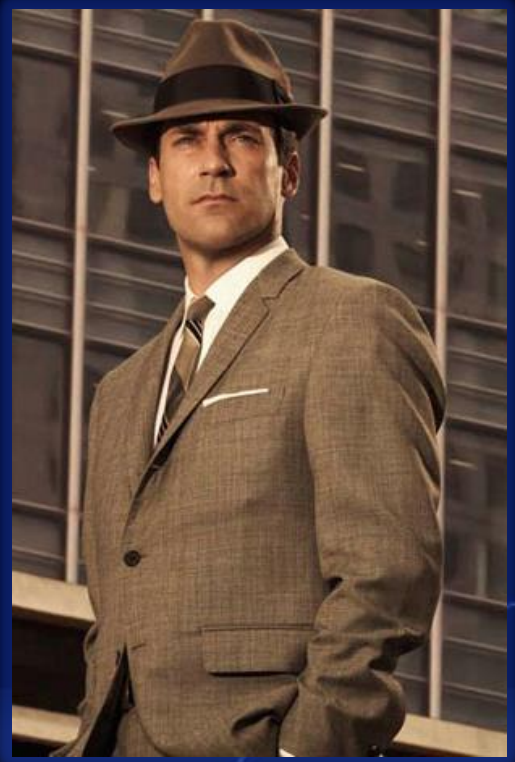
- Performance follows physiology & a dose-response relationship
- Time limit to favorable training response
- Summation of training effects is a function of time
- Presence immediate, delayed, and residual effects

Adapted from Cunanan et al., 2018, Selye, 1946, Viru, 1994

Adding context to control complexity

Understanding the role of athlete monitoring

The tailor



The coach

Utility of athlete monitoring

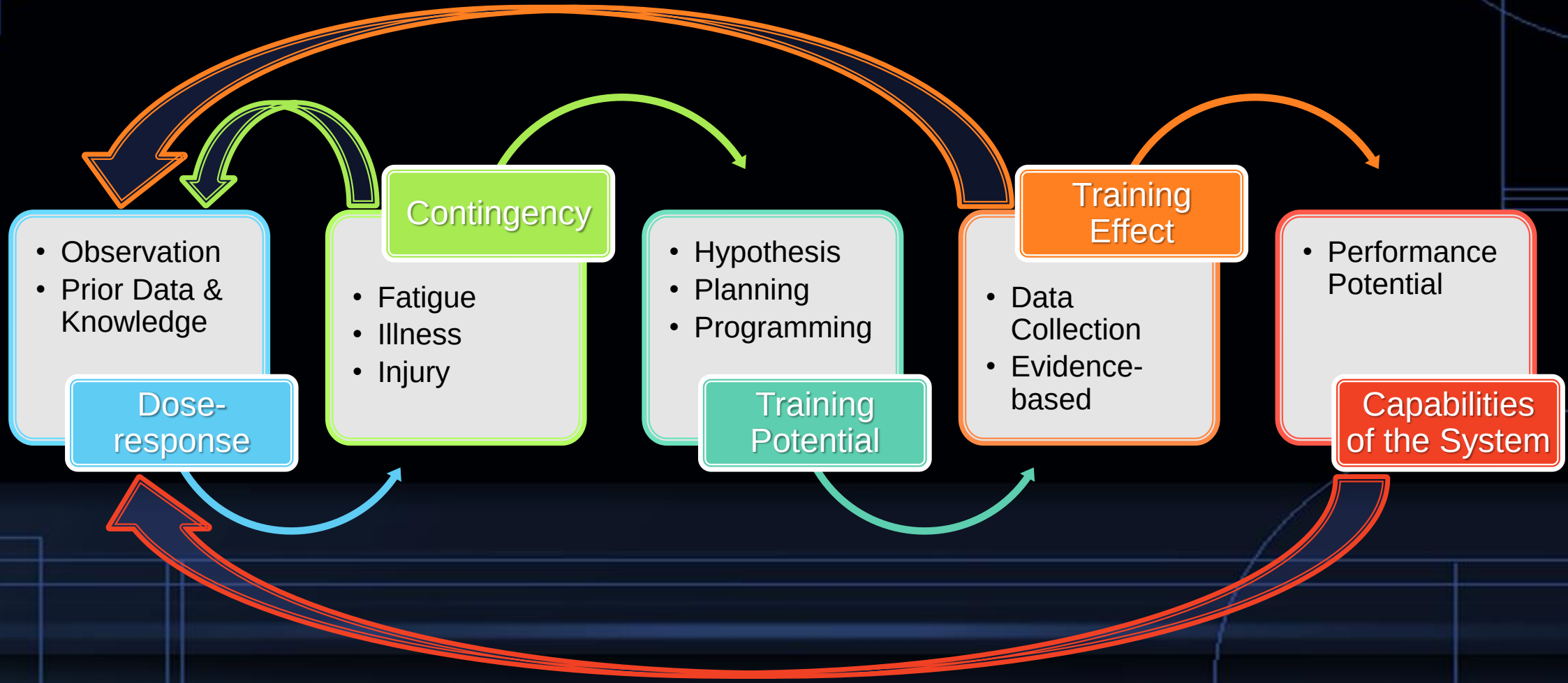
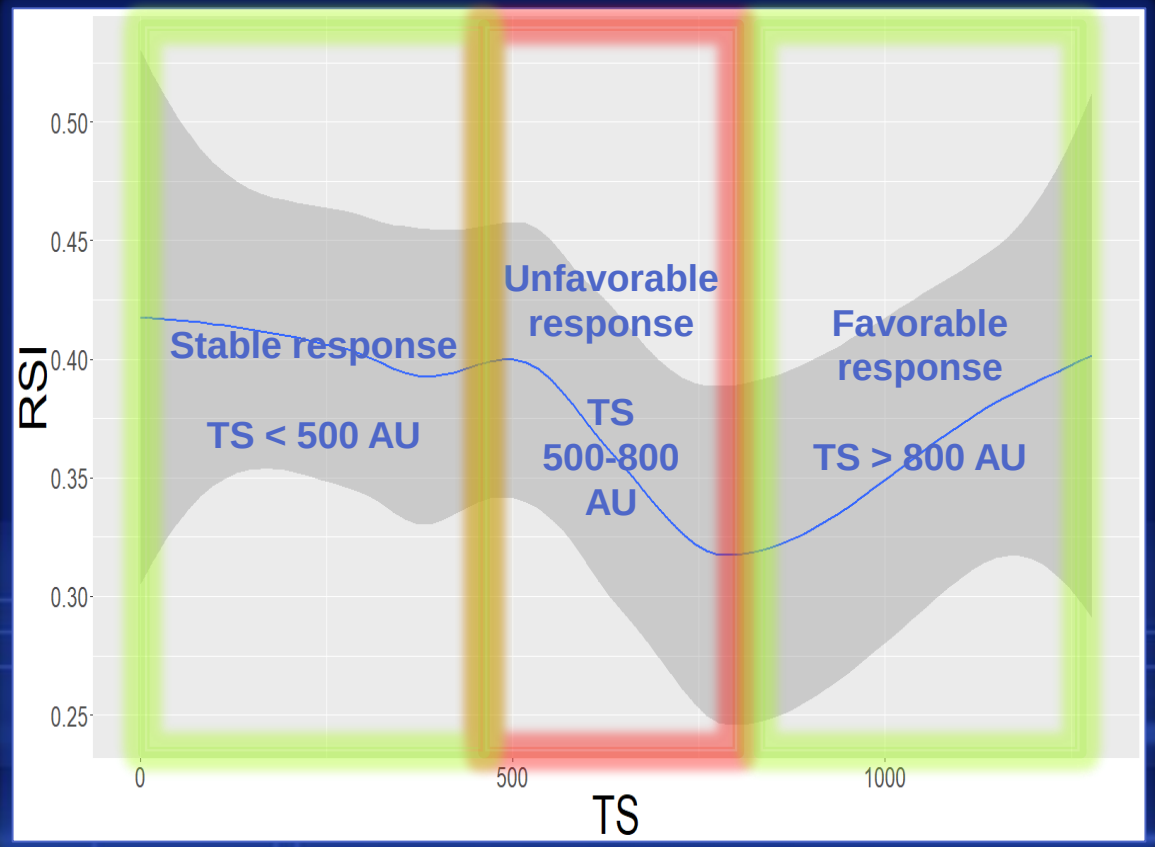


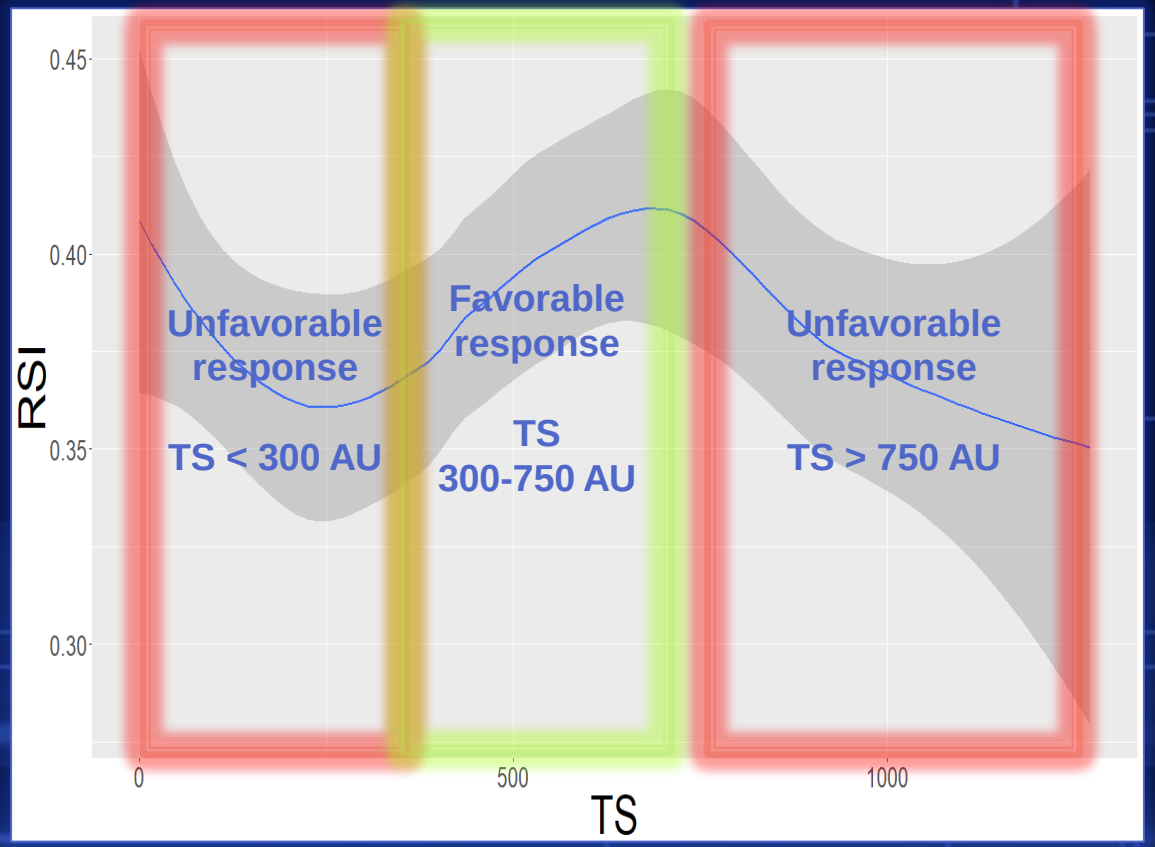
Figure adapted from Martinez, 2018; Sands et al., 2005; Sands, 2016; Verkhoshansky & Siff, 2009

Dose-response & Orientation

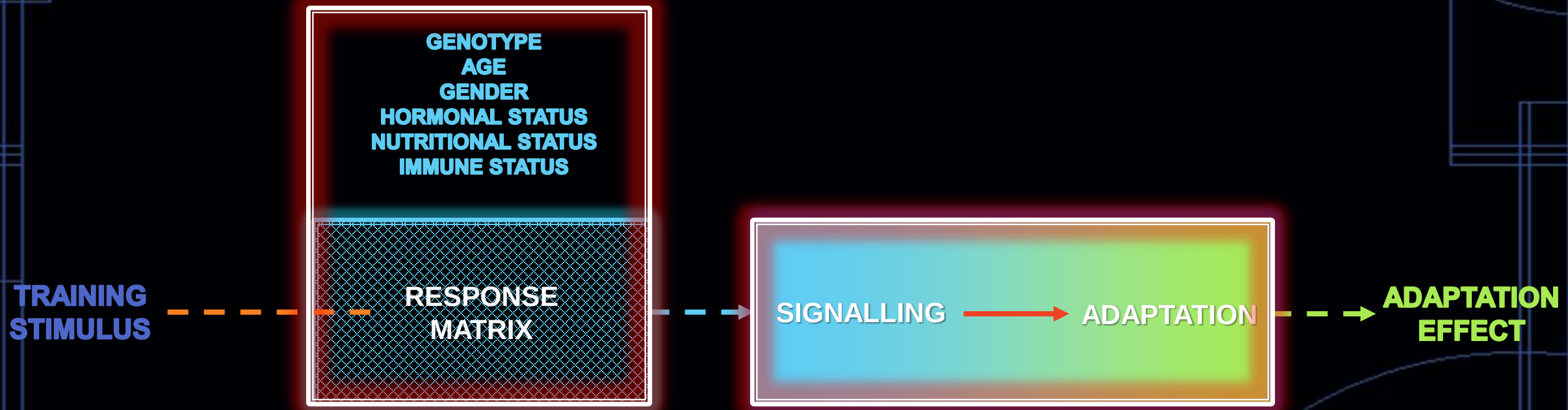
‘Strong’ Athlete



‘Weak’ Athlete

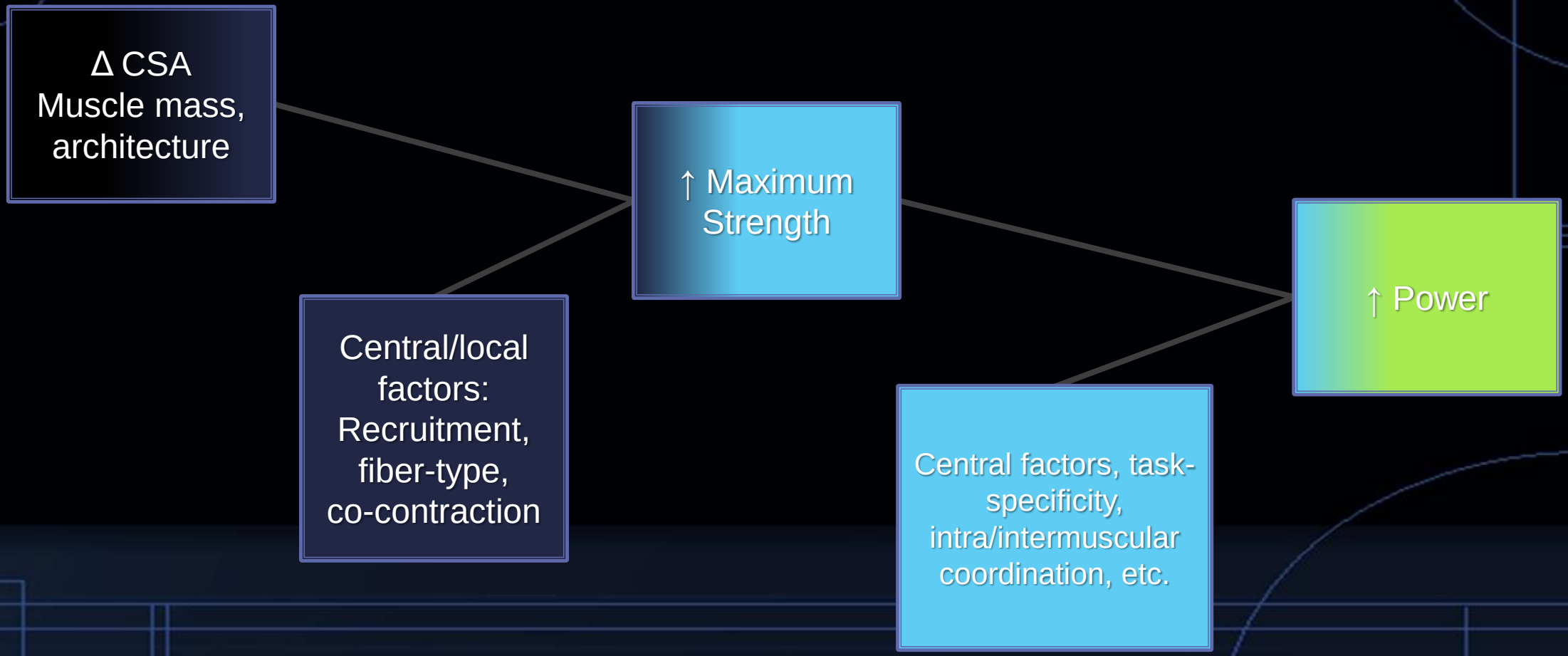


Acknowledging individuality



Adapted from Toigo & Boutellier (2006)

Training potential



Adapted from Minetti, 2002, Zamparo et al., 2002, and Stone, ND

Training potential

BASIC STRENGTH	ABSOLUTE STRENGTH	ABS. STRENGTH/STRENGTH-SPEED
3x5/3x5/3x5 85/90/92.5%	3x3/3x3/3x3 85/92.5/75%	4x3/3x2/3x2 85/90/95%

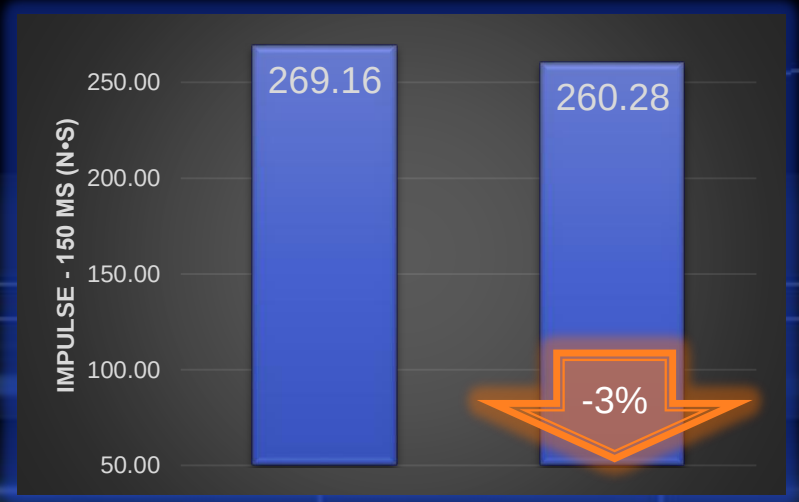
Training effect

- Body mass
- Girth
- Skinfolds

- Loaded static jumps (0-80 kg)
- Primary variables of interest:
  - JH, PPa, F @ PP, v @ PP

- Isometric MTP
- Primary variables of interest:
  - IPFa
  - RFD – 50 ms
  - Impulse – 150 ms

Training effect



Keeping an eye on the objective

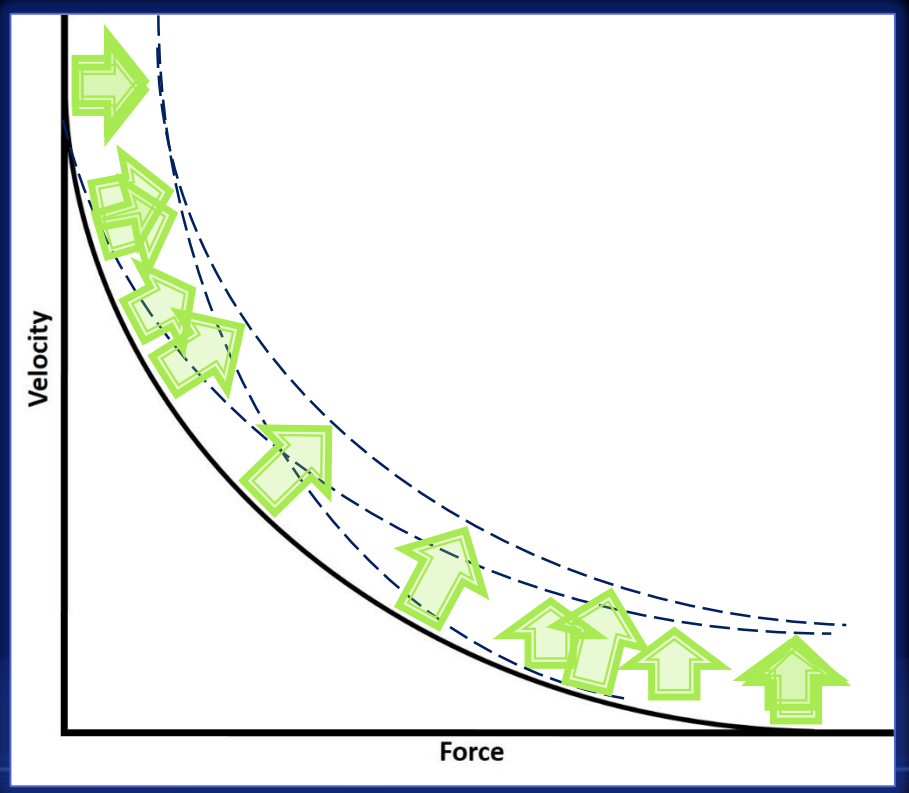


Figure adapted from Haff & Nimphius, 2012

Time course of adaptations

Cohen's *d* Effect Size				
Load	**JH - FT**	**PP-a**	**F @ PP**	**V @ PP**
0 kg	0.06 ⇧ Trivial	0.00 ⇔ Trivial	0.01 ⇔ Trivial	0.00 ⇔ Trivial
20 kg	0.09 ⇧ Trivial	0.07 ⇧ Trivial	0.10 ⇧ Trivial	-0.02 ⇔ Trivial
40 kg	0.08 ⇧ Trivial	0.06 ⇧ Trivial	0.11 ⇧ Trivial	-0.03 ⇔ Trivial
60 kg	0.17 ⇧ Trivial+	0.20 ⇧ Small	0.12 ⇧ Trivial	0.19 ⇧ Trivial+
80 kg	0.23 ⇧ Small	0.09 ⇧ Trivial	0.09 ⇧ Trivial	0.04 ⇧ Trivial

Minimizing contingencies

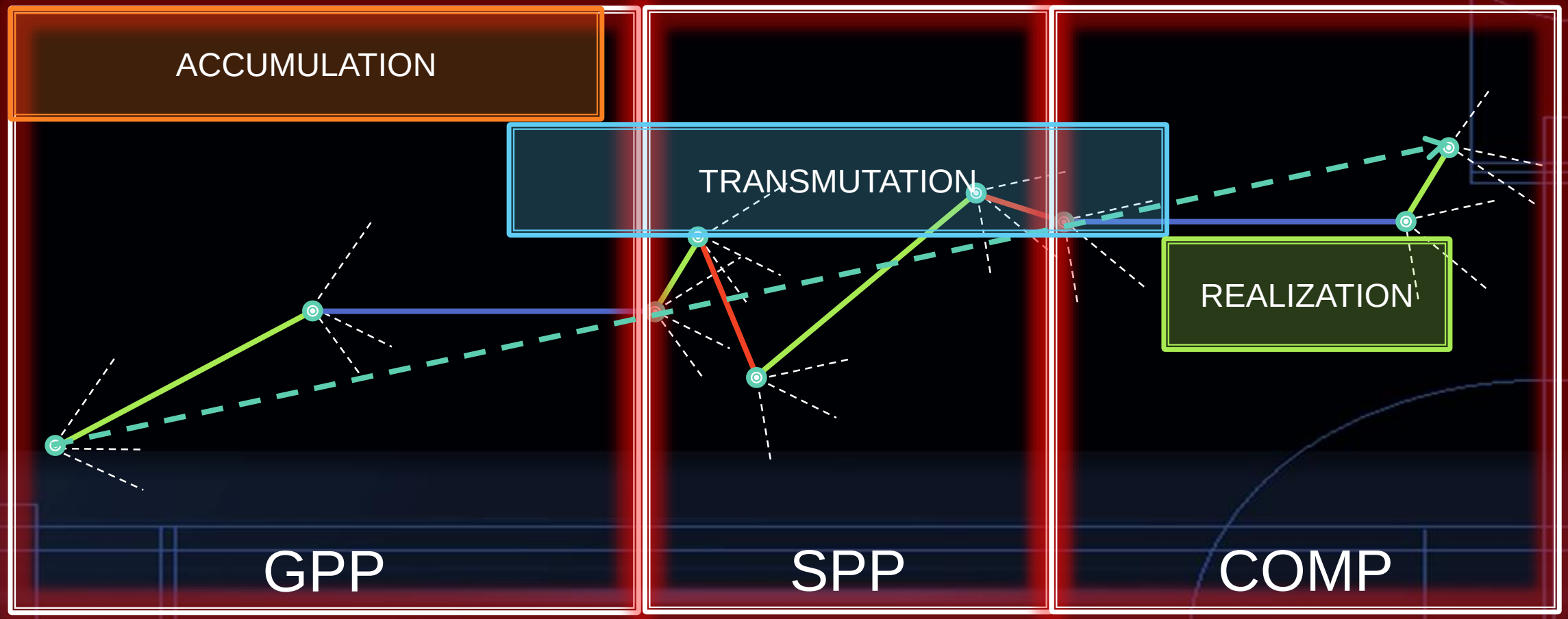


Figure adapted from Sands & McNeal, 2000

Trust the (guided) process

Periodization manages uncertainties

Periodization provides context to athlete monitoring

Athlete monitoring emphasizes relevant information to manage risks

Minimizing contingencies & leveraging necessities

Maximizing likelihood of competitive success & creates platform for ongoing study

Closing remarks

- Periodization provides a robust blueprint that has withstood the rigors & conditions of high-level athletics
- Self-similarity & scalability are characteristics of periodization that warrant greater consideration
- Athlete monitoring augments & optimizes periodization – not replaces it

"Plans are useless, but planning is indispensable."

Dwight D. Eisenhower

Thank you





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Supplementary materials available upon request.

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