



One With Breathing

“Personal Empowerment from Within”

Breathing Applications for Optimal Performance in Sport and Daily Life

AAPB 56th Annual Scientific Meeting
Baltimore, 2026

Presenter: H. van der Lei, PhD.

Before we begin, some considerations....

- ▣ Life is performance
 - Performance = The act of executing, accomplishing or fulfilling a task, duty, or function.

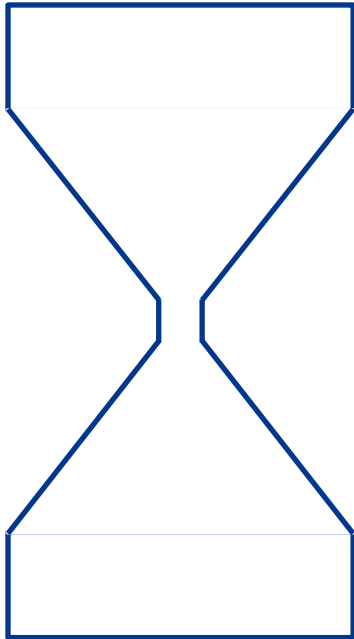
- ▣ Life is about probability

- ▣ Life is change

One With Breathing: Overview

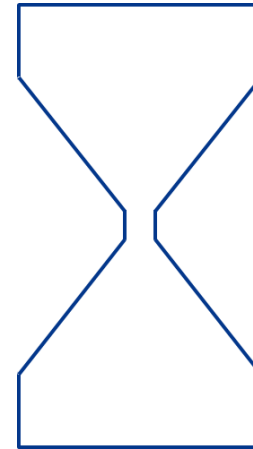
1. **Hourglass Performance Model**
 - Research
 - Life
 - Stress
2. **Breathing Interventions**
3. **Spirunion ModelTM**
 - Introduction
 - Breath connections
4. **Personal Breathing Applications**

1. Hourglass Performance (HP) Model



“Life is Action in Time”

1. Hourglass Performance (HP) Model: Research



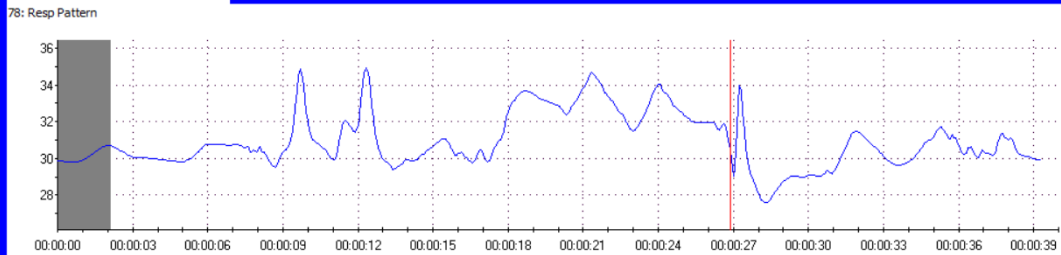
Hourglass Performance (HP) Model: Initial (biofeedback) research in golf

- Dissertation (2010)
- Participants:
 - 3 collegiate golfers of a Division 1 University
- Procedure:
 - Recording of 3 competitive rounds of golf
- Measures:
 - Physiology (i.e., Heart rate, Respiration patterns)
 - Affect grid score card (Subjective arousal levels)
 - Golf data sheet (i.e., Execution, Decision making, Outcome scores)
 - Video (i.e. timing, routine behaviors)
- Results:
 - Hourglass Performance Model proposal

Biofeedback research in golf: Raw physiological data

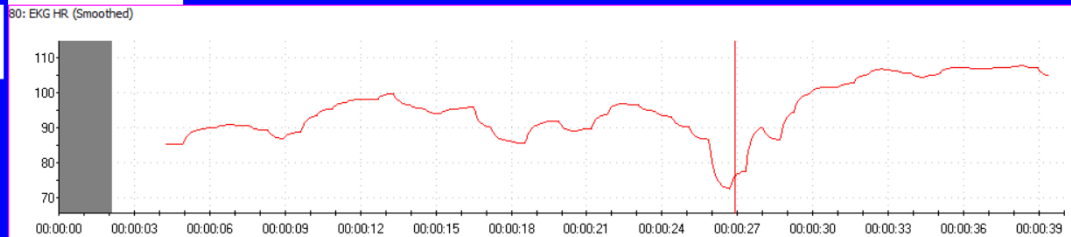
27

G: Respiration Pattern



75

A: EKG IBI



Biofeedback research in golf: Video demo

27

G: Respiration Pattern

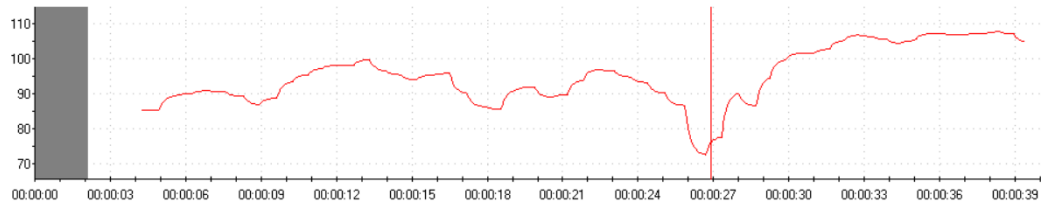
78: Resp Pattern



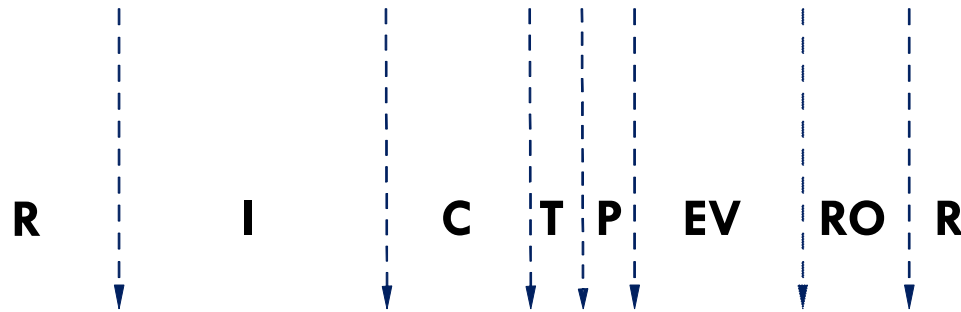
75

A: EKG IBI

80: EKG HR (Smoothed)

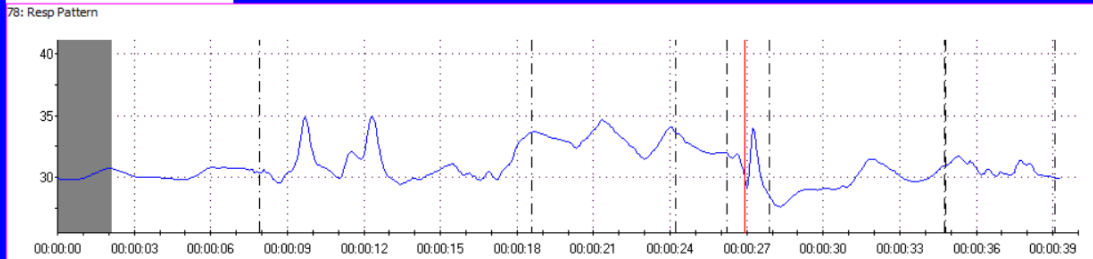


Biofeedback research in golf: Physiology and performance phases



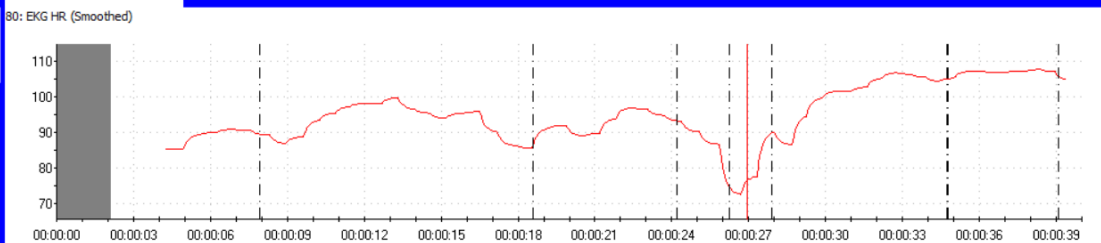
27

G: Respiration Pattern

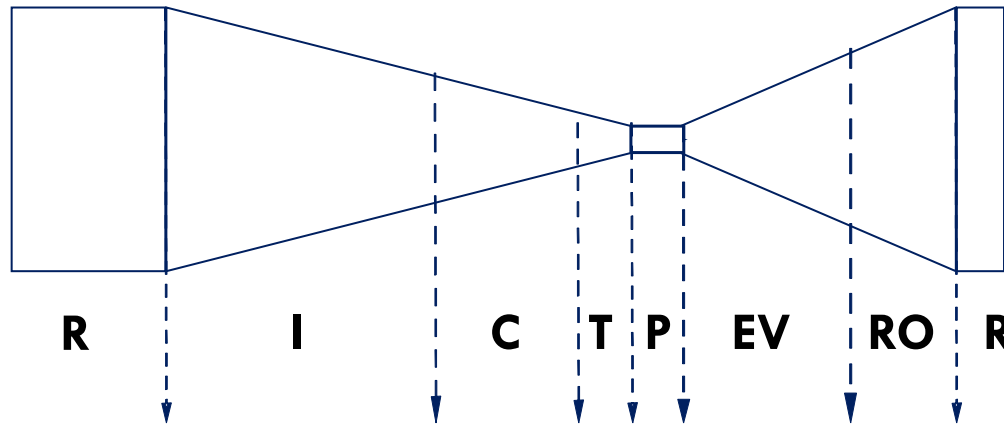


76

A: EKG IBI

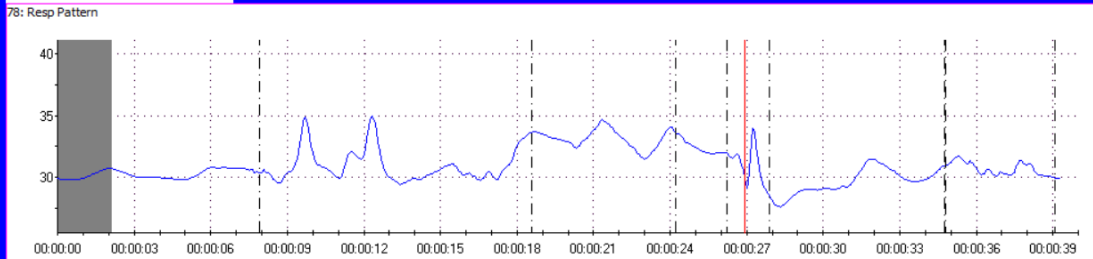


Initial Hourglass Performance Model: Physiology and performance phases



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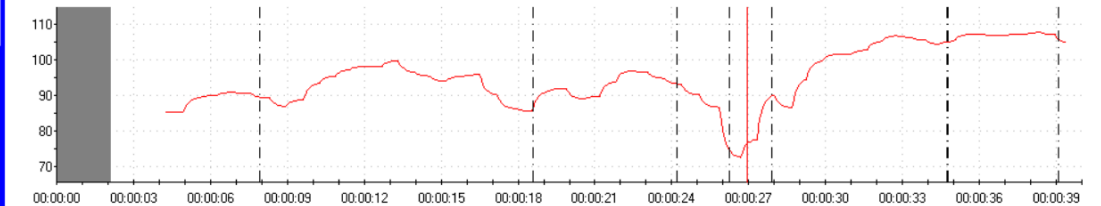
G: Respiration Pattern



76

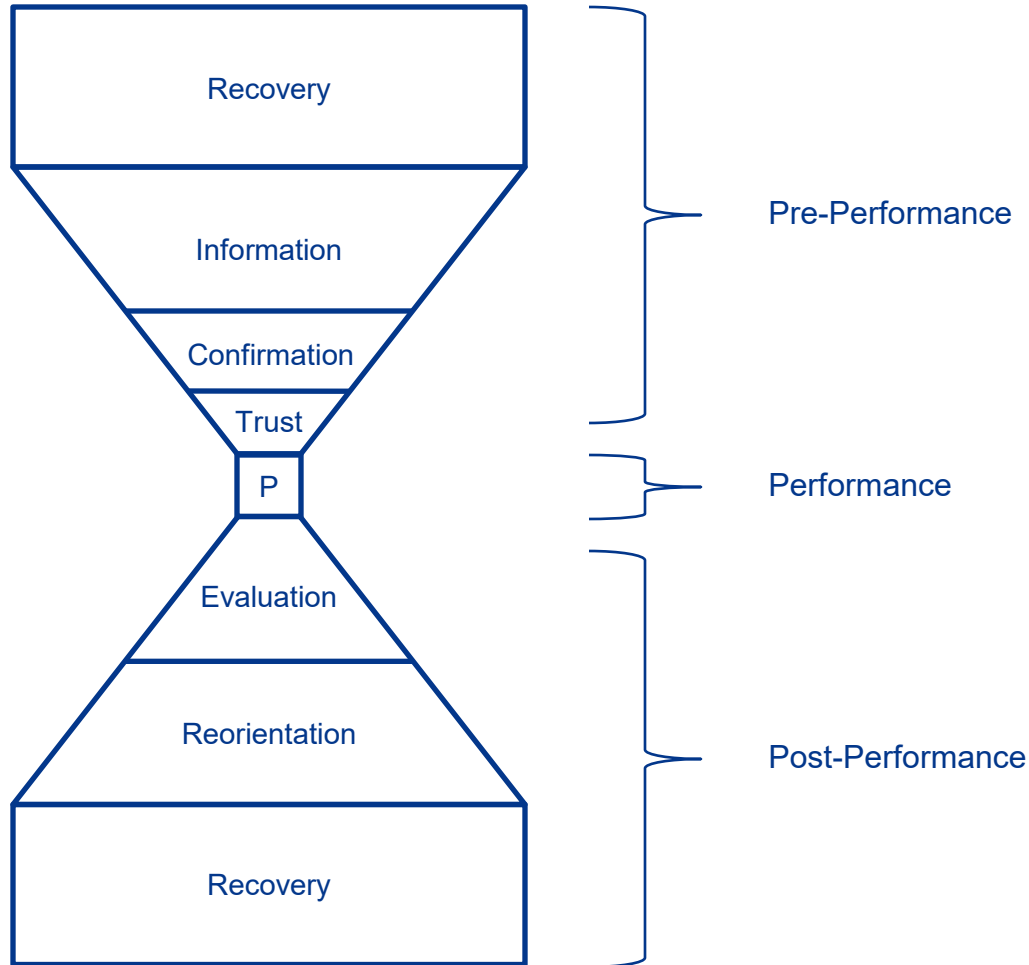
A: EKG IBI

80: EKG HR (Smoothed)



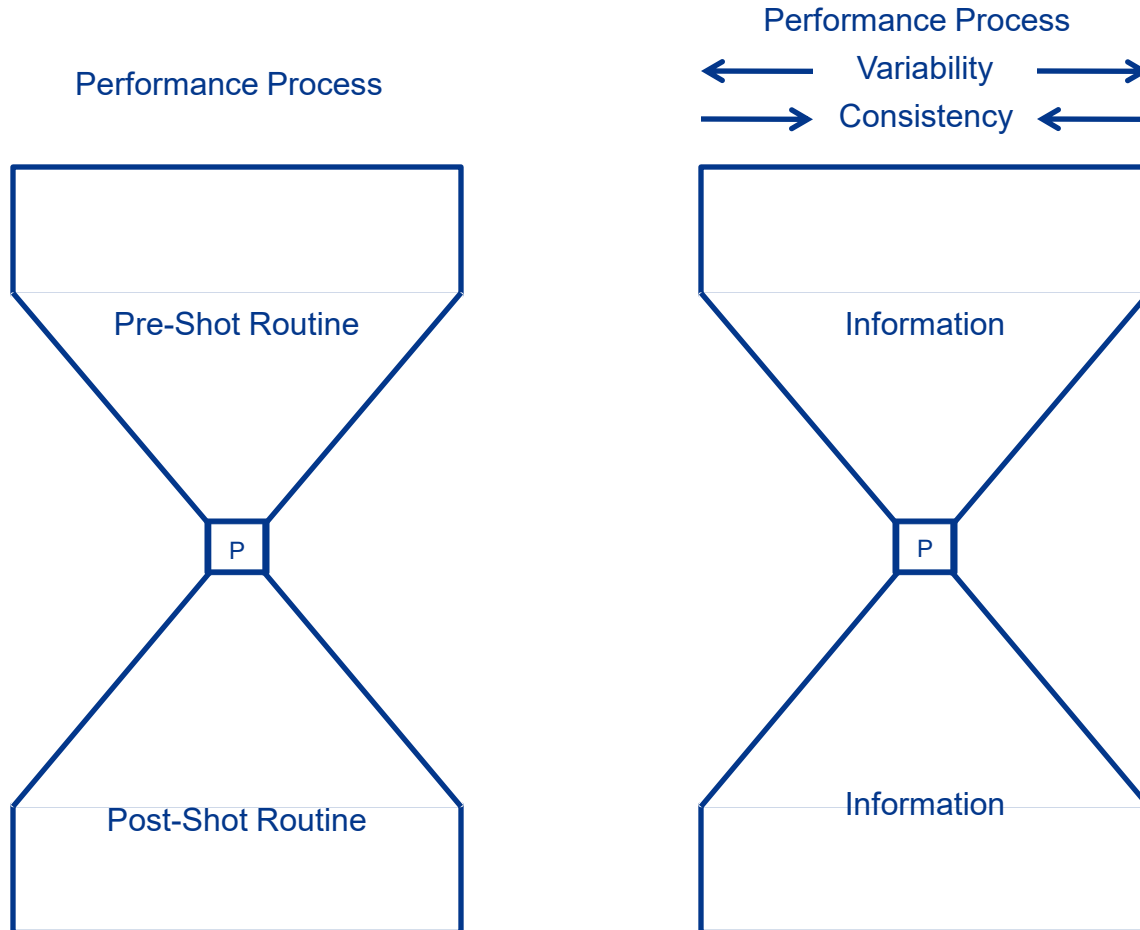
Hourglass Performance (HP) Model

Performance and functional performance phases

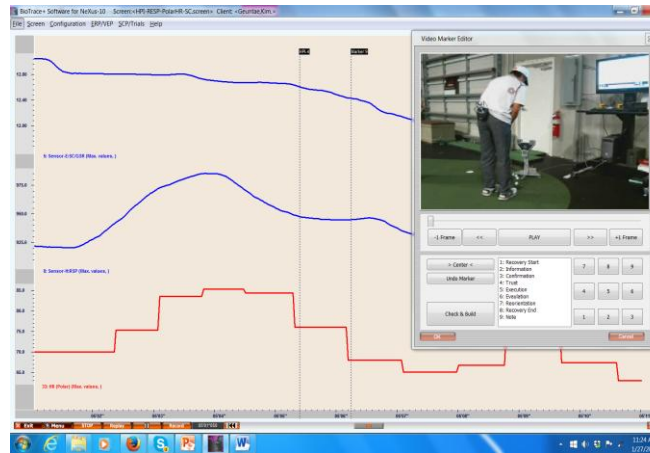
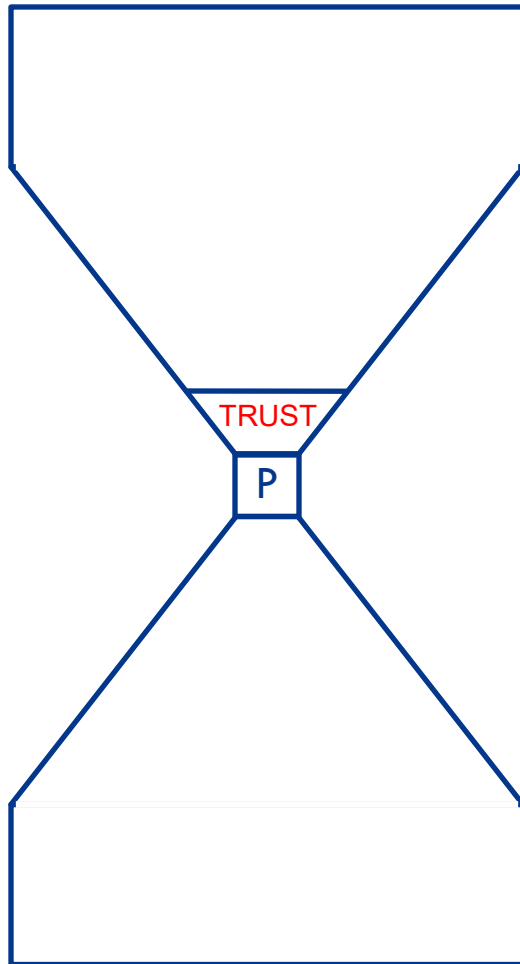


Why the shape of the HP Model ???...

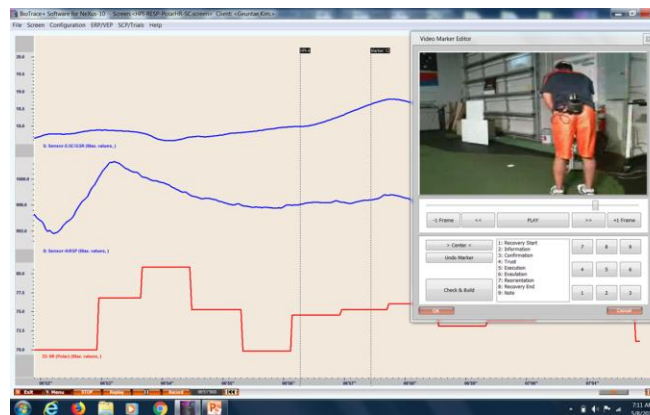
Information and Consistency!



The shape of the HP Model-Consistency Trust Phase: Where the Body meets the Brain!



Good Trust



Poor Trust

Effects of Thoughts and Emotions on the HP Model

Small HP Model

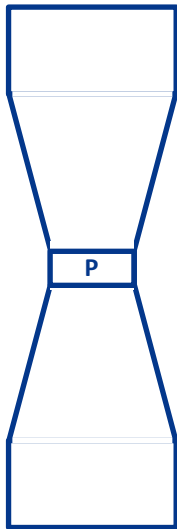
Uncontrolled emotions

Forgetful

Rushing

Too fast

Conscious skill execution



Optimal HP Model

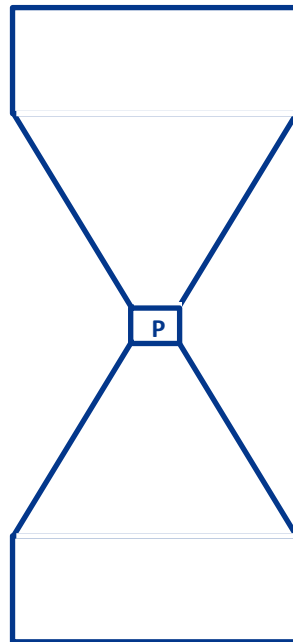
Controlled emotions

Focused

Trusting

Natural

Automated skill execution



Large HP Model

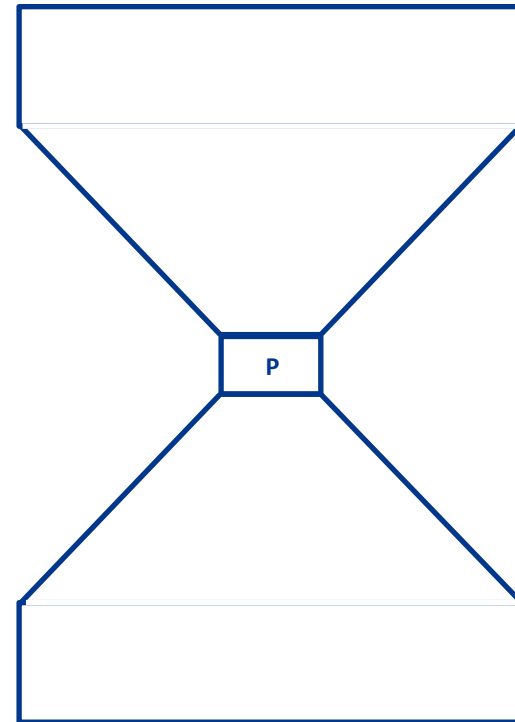
Uncontrolled emotions

Distracted

Hesitating

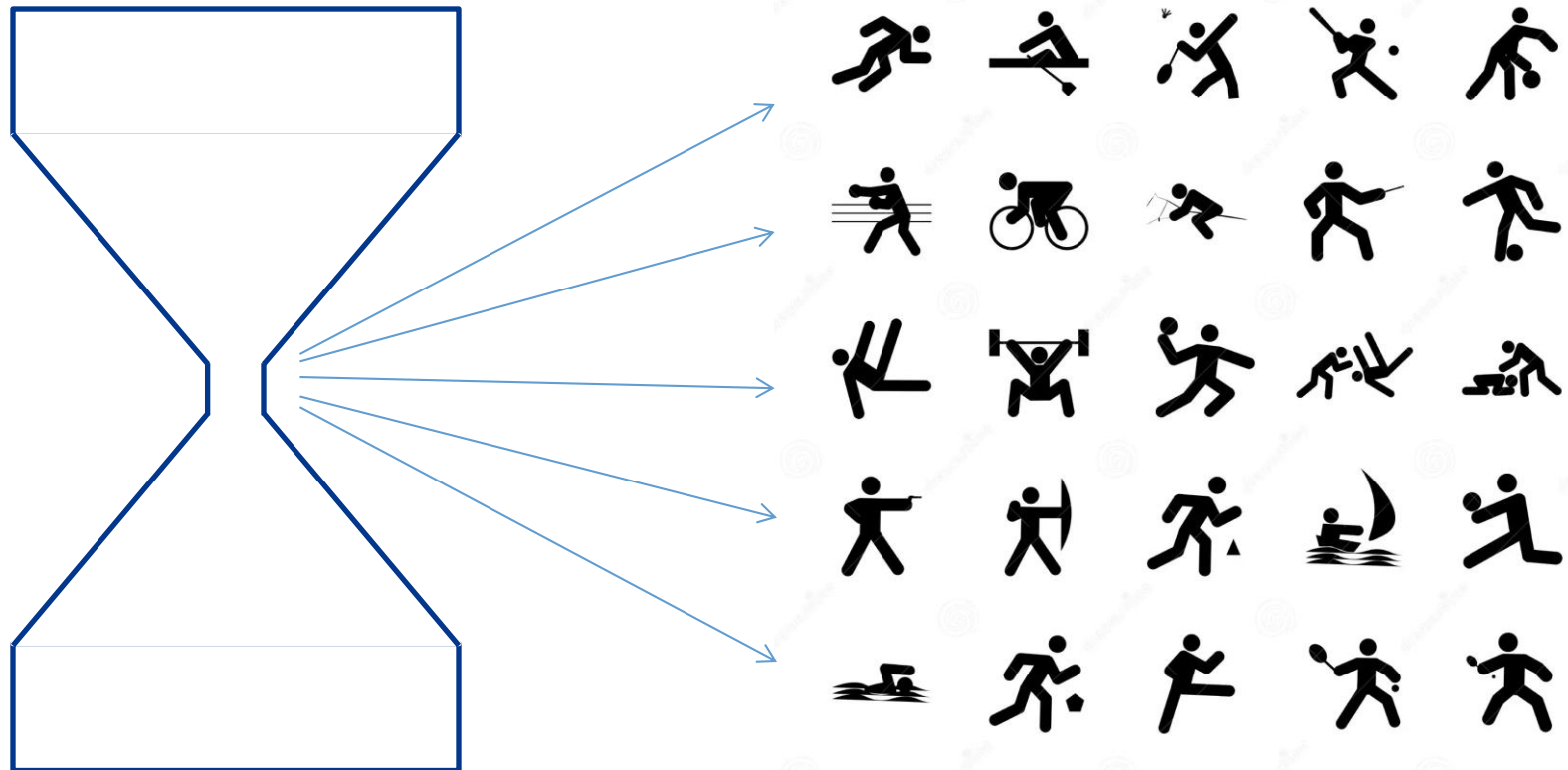
Too slow

Conscious skill execution



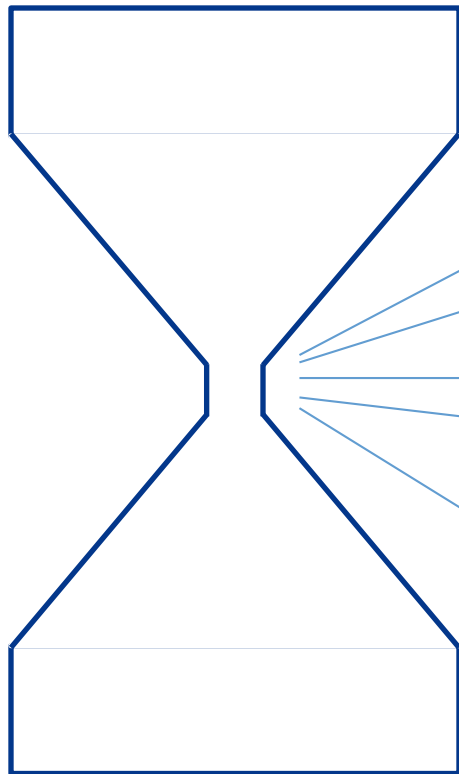
Applicability of the HP model principles?

Any type of sport performance!



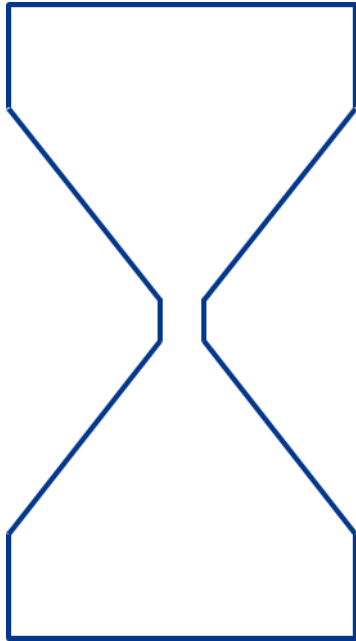
Applicability of the HP Model principles?

Any type of life performance!



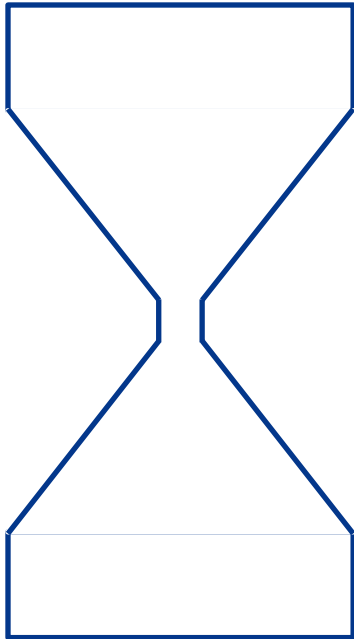
Hourglass Performance (HP) Model

Summary

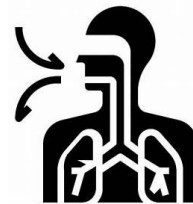
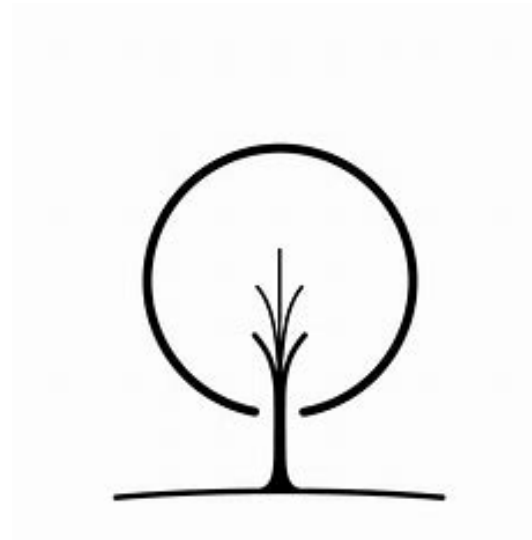


- The principles of the HP model have been validated by research findings in many different types of expertise including cognitive-behavioral psychology, physiology, performance, sleep and health science.
- These principles are important to optimize many different types of performance in life, physical activities, focus, information processing, problem-solving, empathy, communication, decision-making, stress and sleep management.

1. Hourglass Performance Model: Life

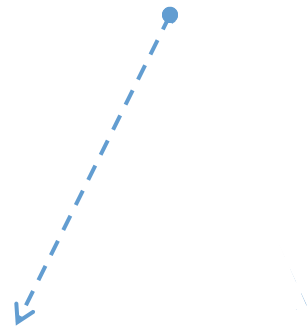


Life is change!



Daily Life Functioning: Changes between Performance and Recovery

Performance

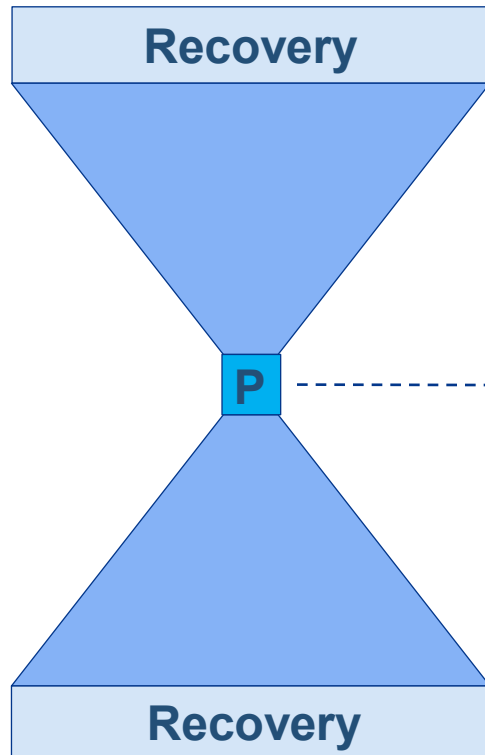


Recovery



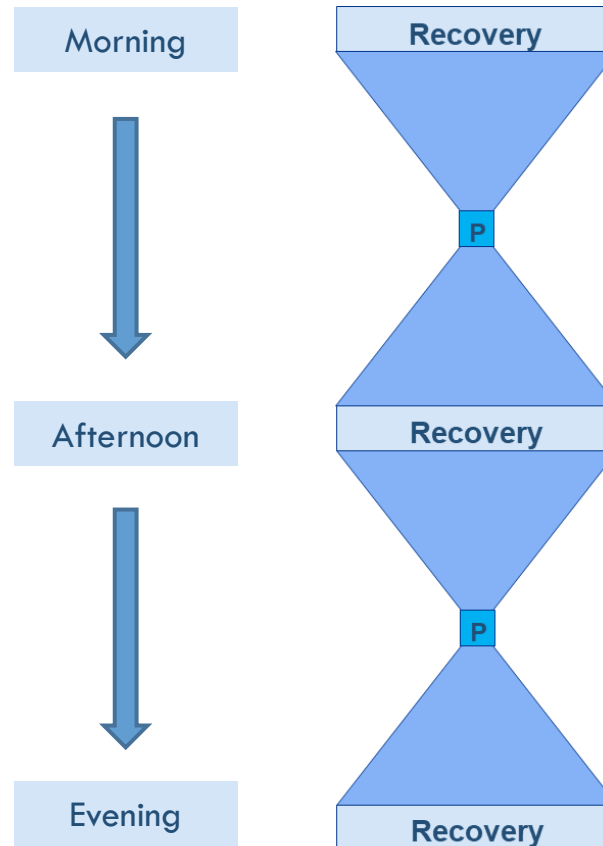
Daily Life Functioning: HP Model

Changes between Performance and Recovery

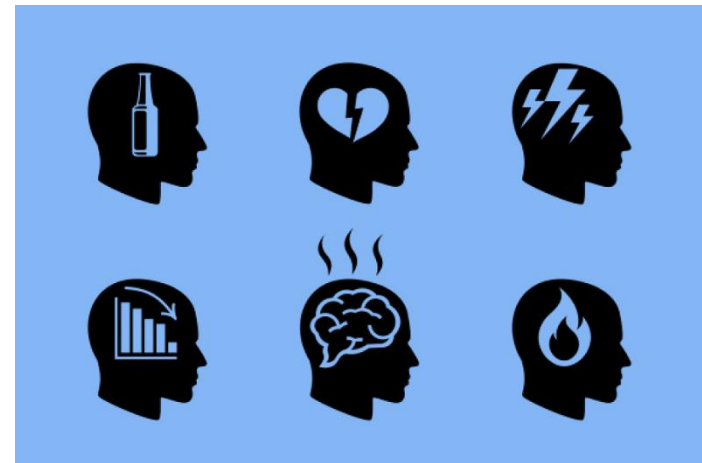
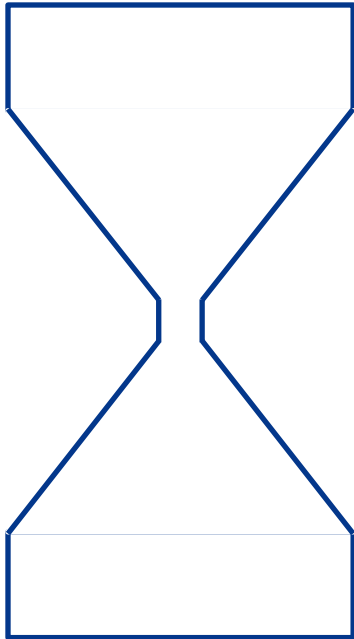


Daily Life Functioning: Big picture

HP Models

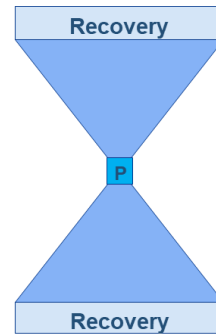


1. Hourglass Performance Model: Stress



Stress is change!

Stress management is managing change!!



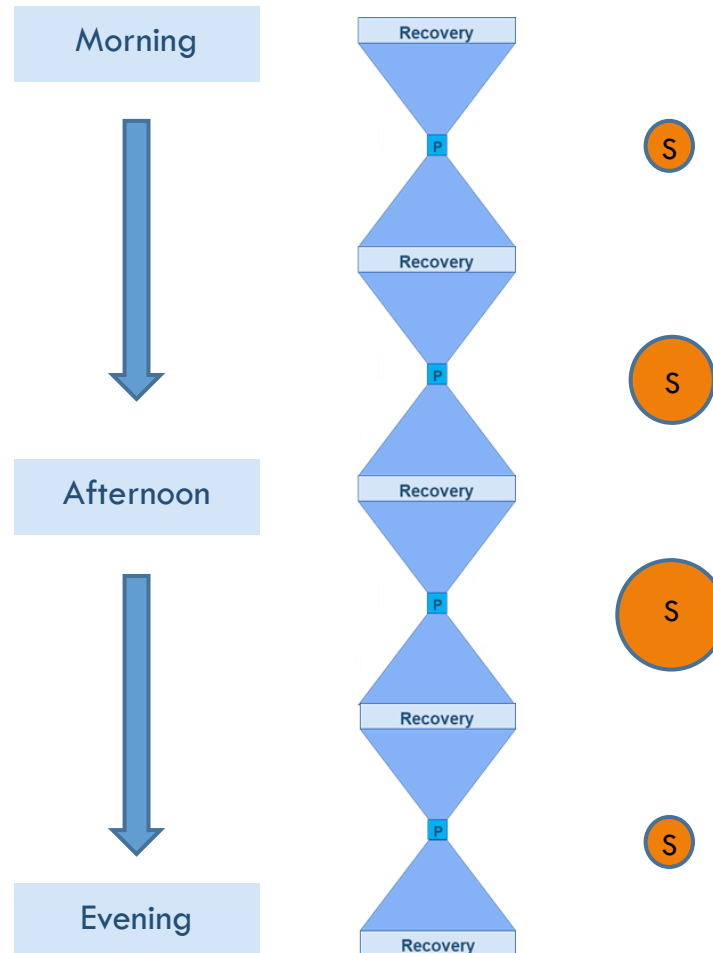
Performance



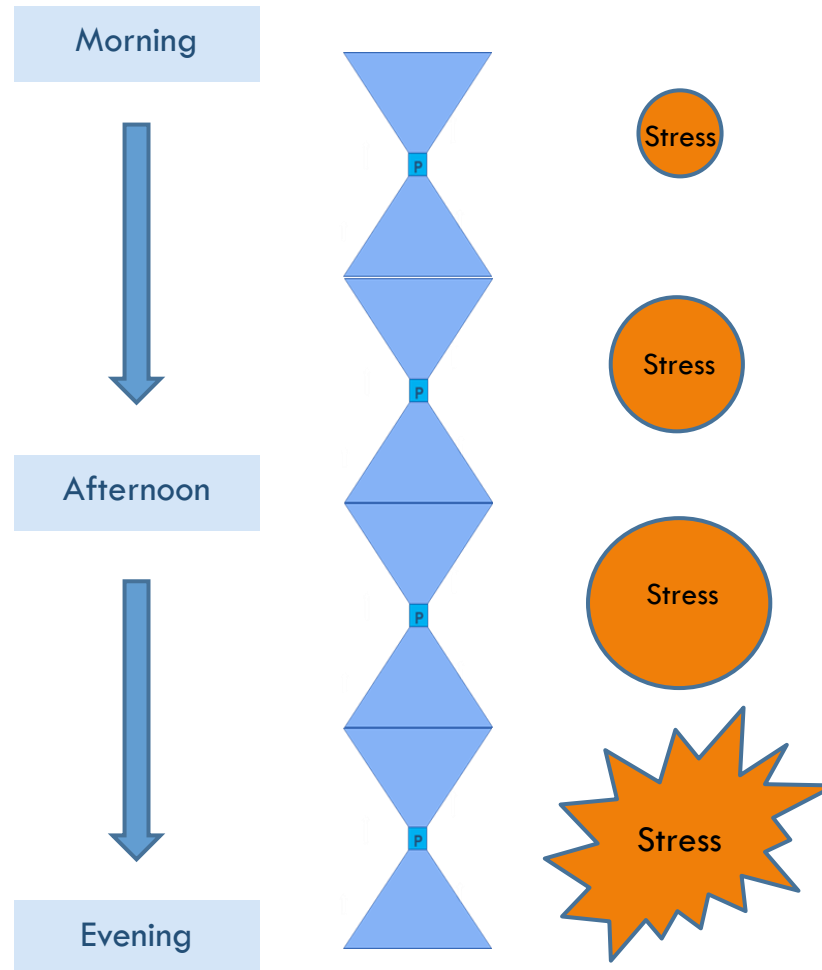
Recovery



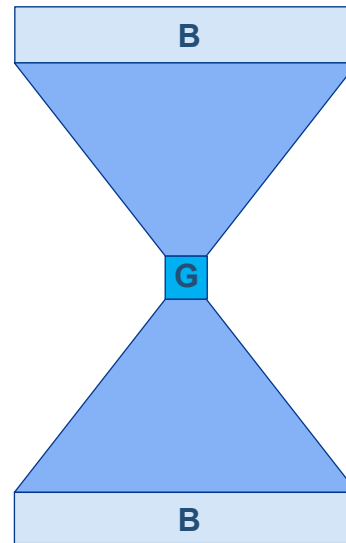
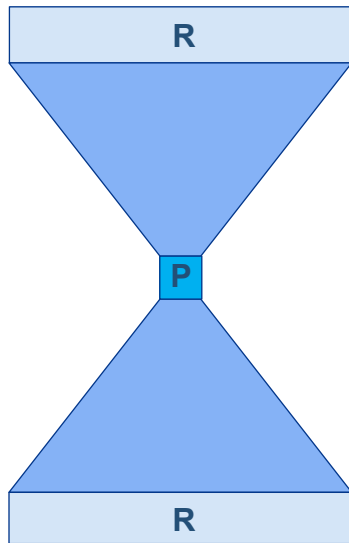
Good stress management: Daily stress with recovery



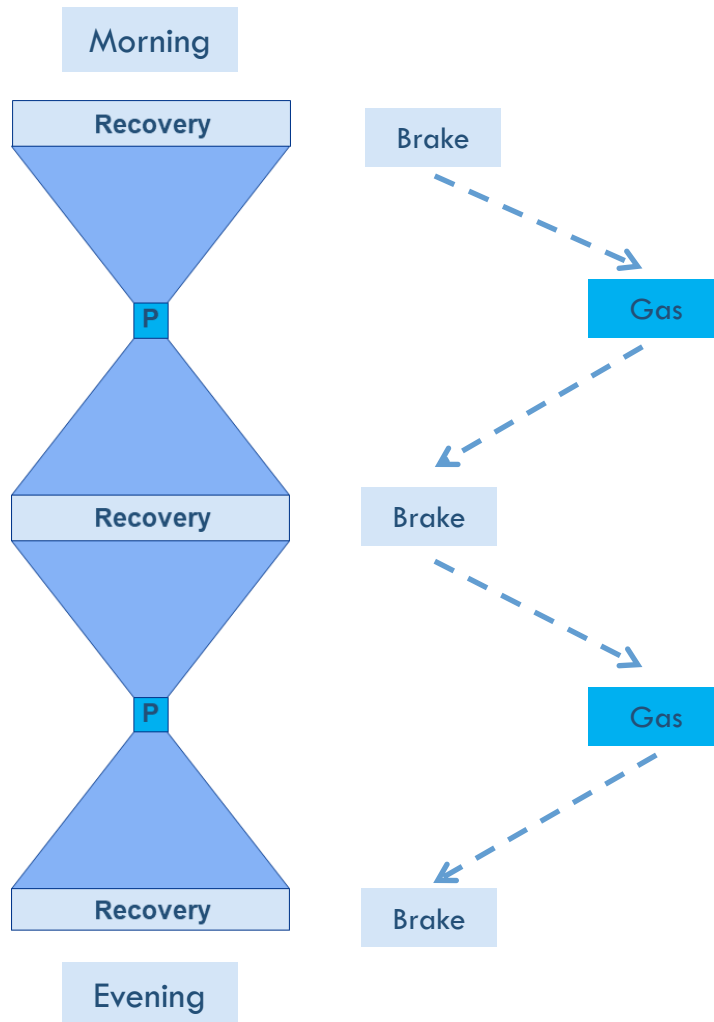
Poor stress management: Daily stress without recovery



HP Model and stress management: Using the gas pedal (G) and brake pedal (B)

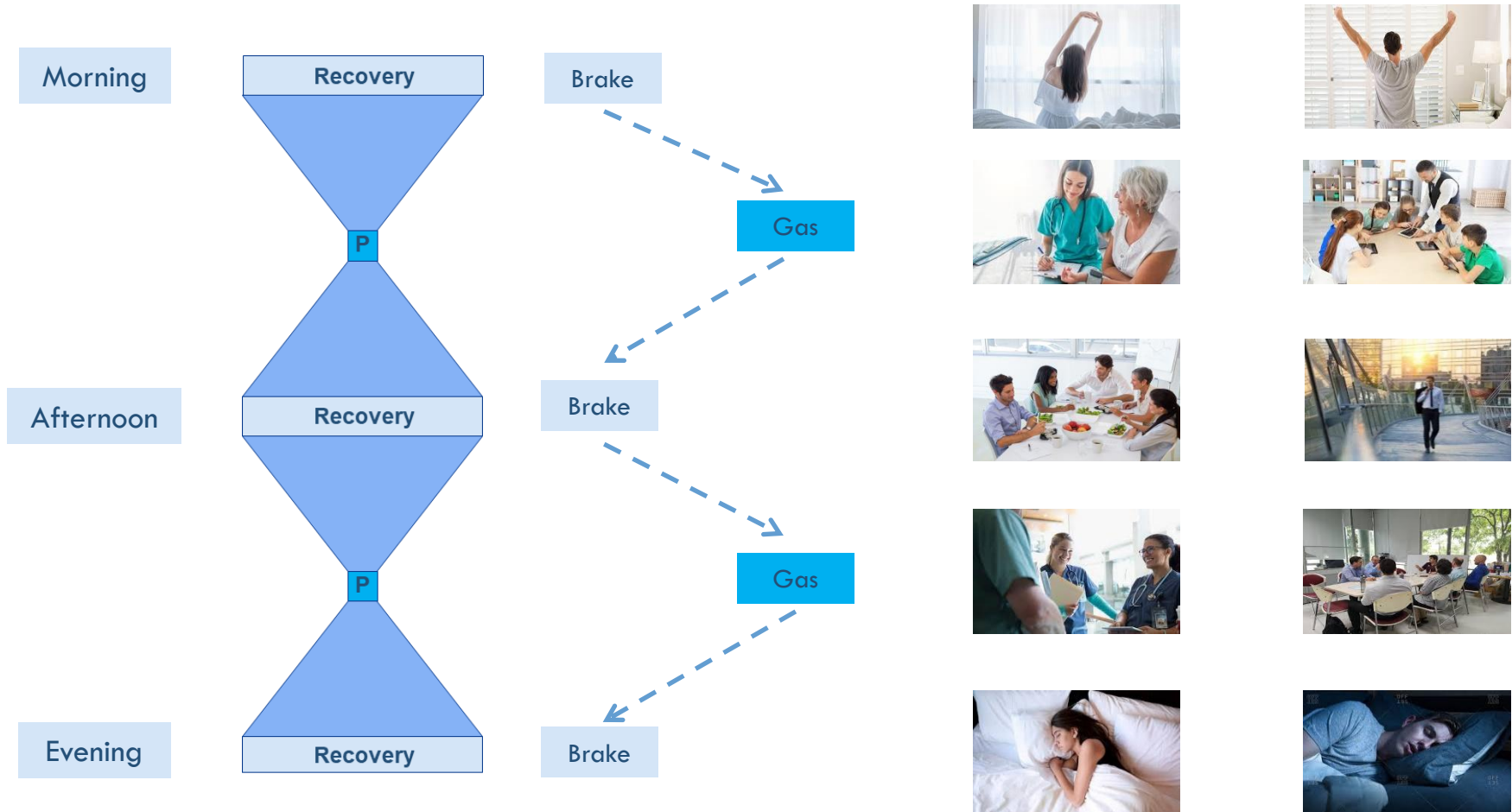


Daily stress management: Controlling the gas and brake pedal



Gas and brake pedal

Daily stress management: Example



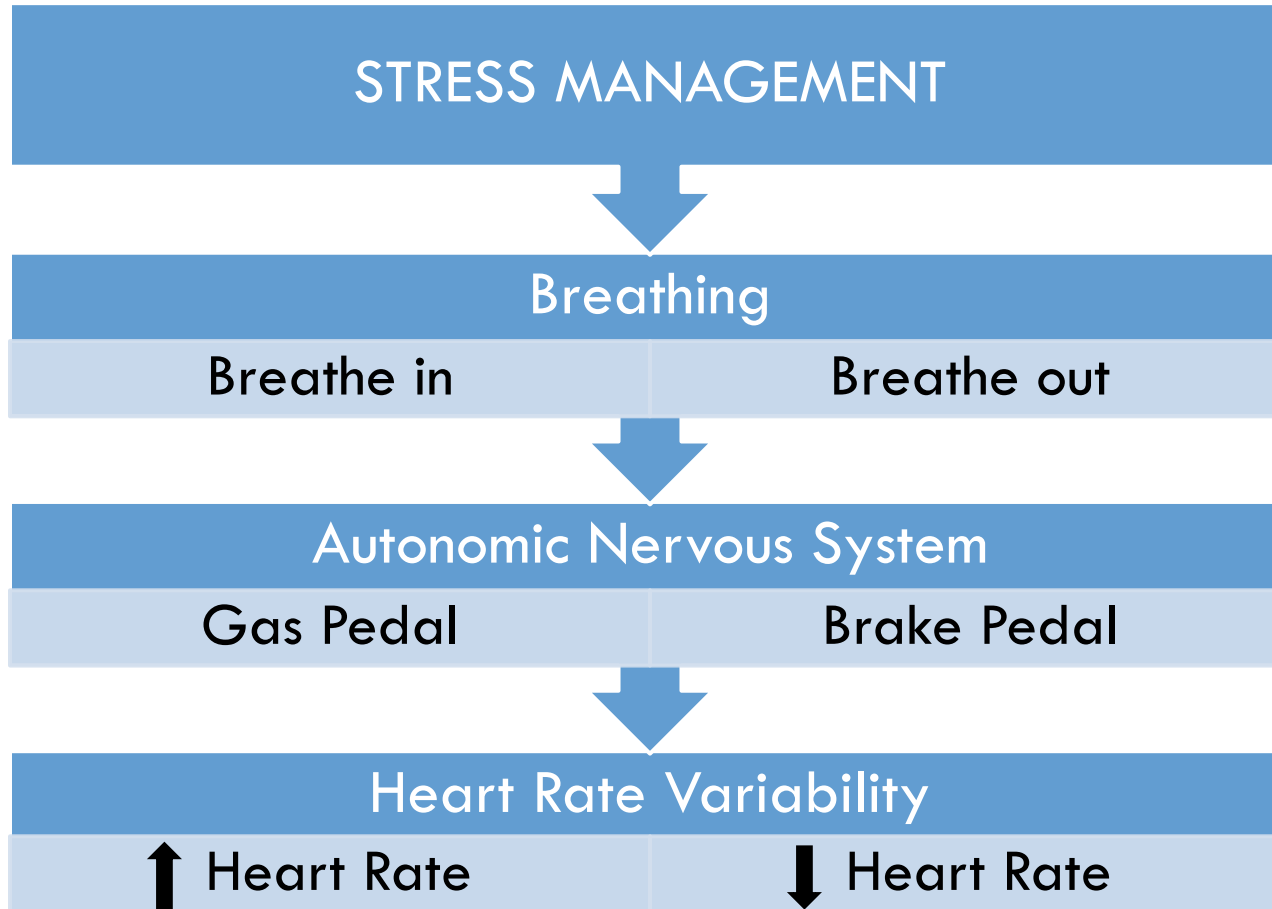
Losing control of the gas and brake pedal: Negative consequences



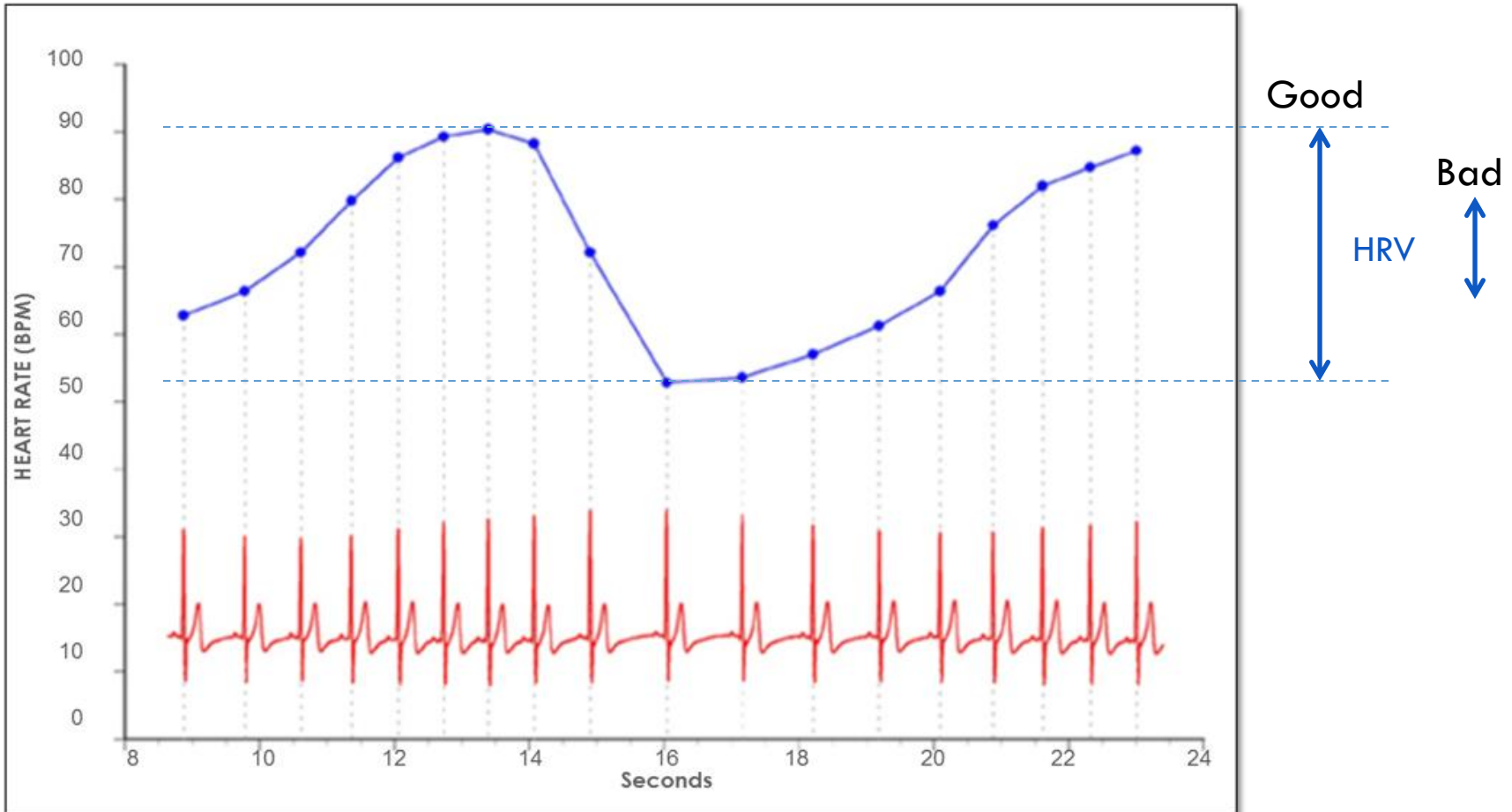
Stress management: How Does Breathing Work?



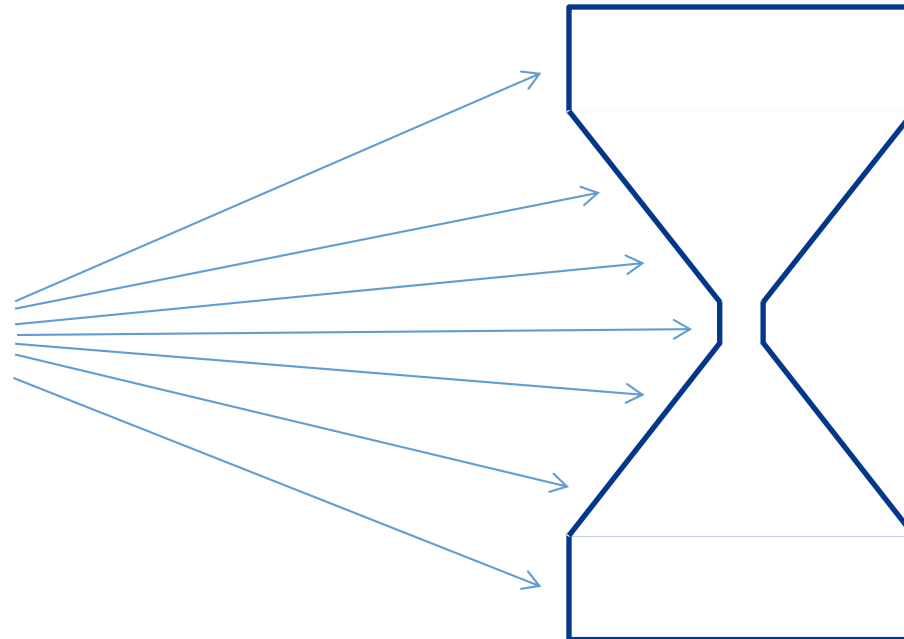
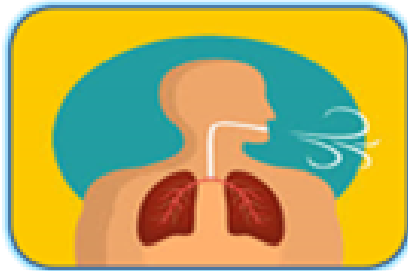
Stress management: How does breathing work?



Stress management capacity Heart Rate Variability (HRV)

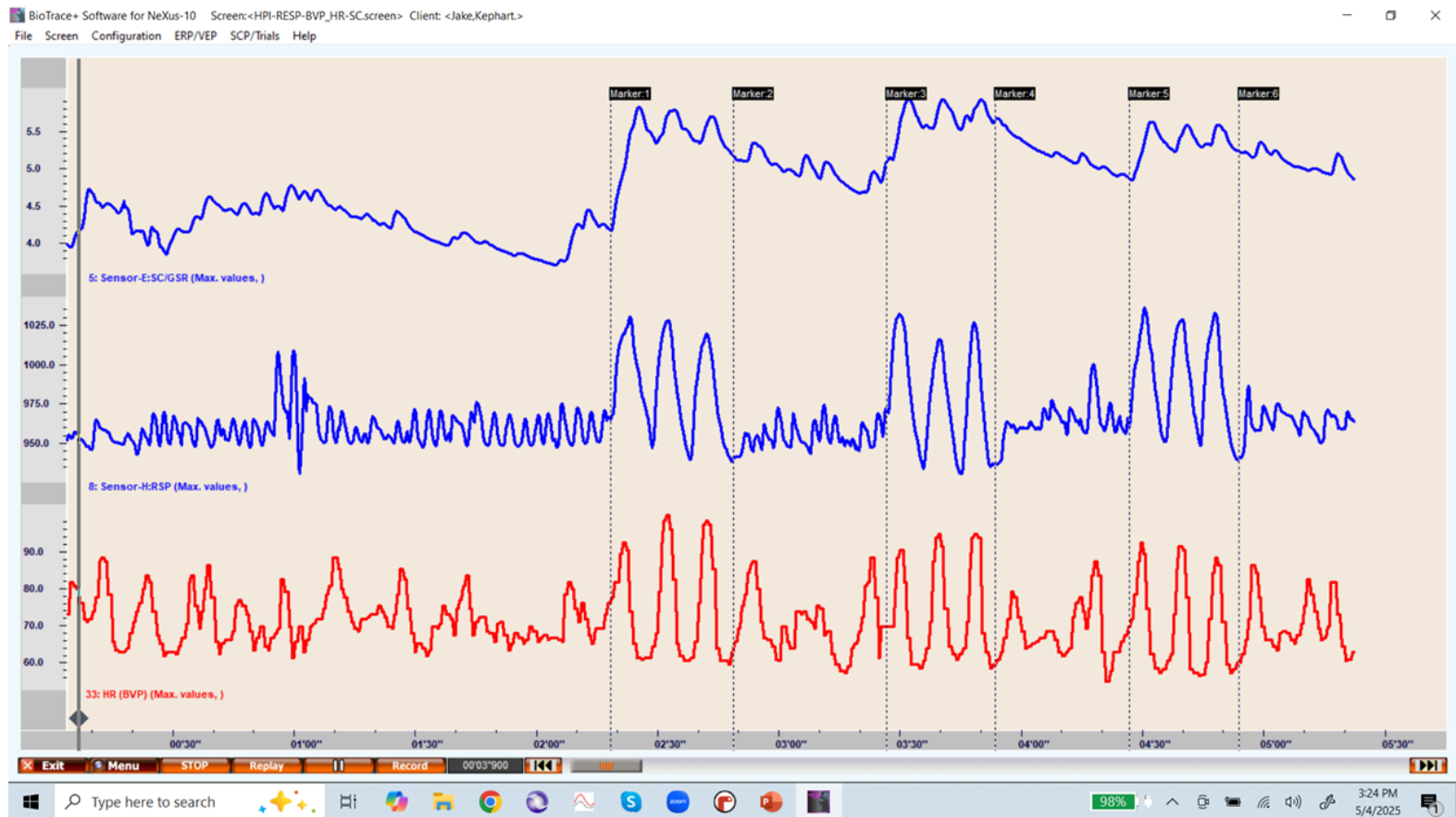


2. Breathing Interventions



Breathing interventions:

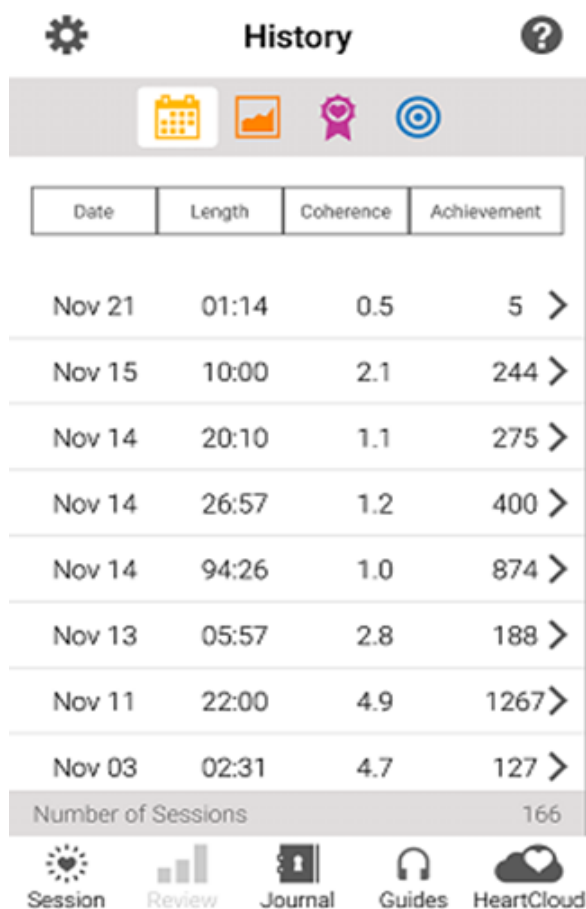
1. Introduction of focused abdominal breathing



1. Demonstration of the power of breathing on the gas and brake pedal!
2. Diaphragm-breathing connection

Breathing interventions

2. Stress management-Simple



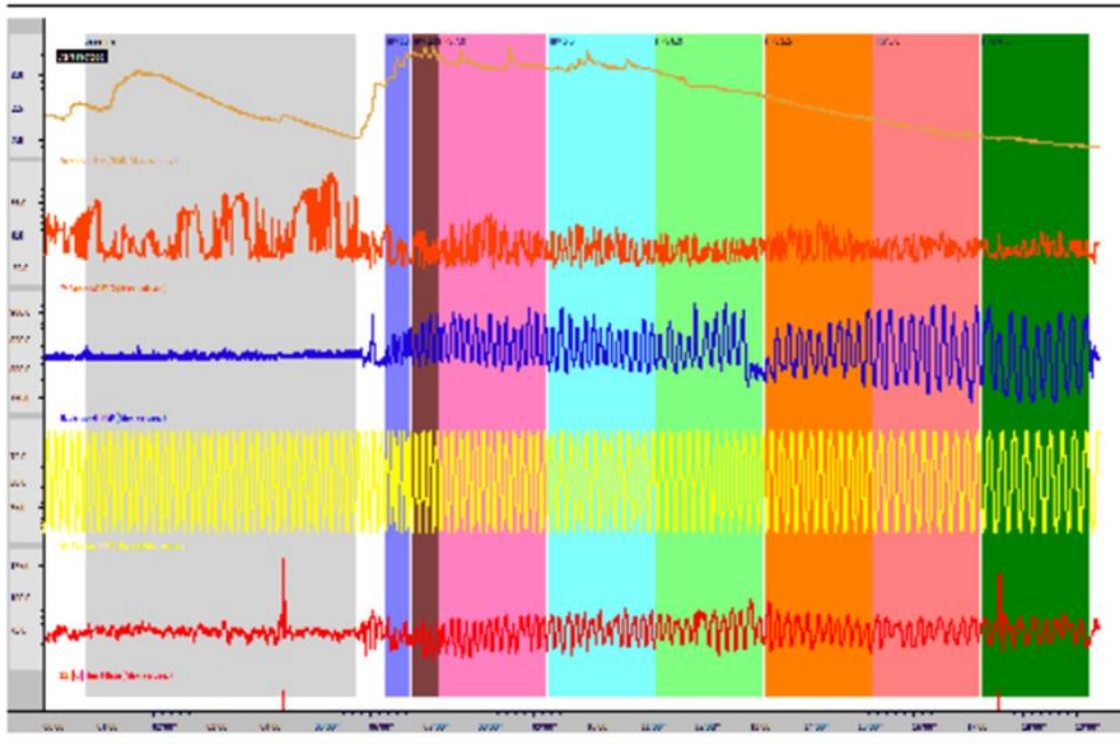
InnerBalance Sensor

Monitoring:

- Compliance
- Training Effects
- Changes in RSA

Breathing interventions in golf

3. Stress management-Complex



HRV resonant frequency information:

Segment-01 [HRV 7.0]: Peak.Freq. 0.117Hz (Power: 2697.7 ms²)
Segment-02 [HRV 6.5]: Peak.Freq. 0.109Hz (Power: 2096.6 ms²)
Segment-03 [HRV 6.0]: Peak.Freq. 0.102Hz (Power: 2722.4 ms²) <-- MAX POWER found at 6.1 cycles/minute.
Segment-04 [HRV 5.5]: Peak.Freq. 0.094Hz (Power: 1903.0 ms²)
Segment-05 [HRV 5.0]: Peak.Freq. 0.082Hz (Power: 1448.4 ms²)
Segment-06 [HRV 4.5]: Peak.Freq. 0.074Hz (Power: 1087.3 ms²)

Automatic Artifact Rejection was ON. [0] user defined artifact area(s) found.

HPI-Gevirtz HRV Protocol:

- HRV Assessment
 - 5 Minute Story
 - Imported into Kubios

- Optimal RF Determination:
 - Pacer
 - 2 minutes segments
 - 4.5-5.0-5.5-6.0-6.5-7.0 sec.

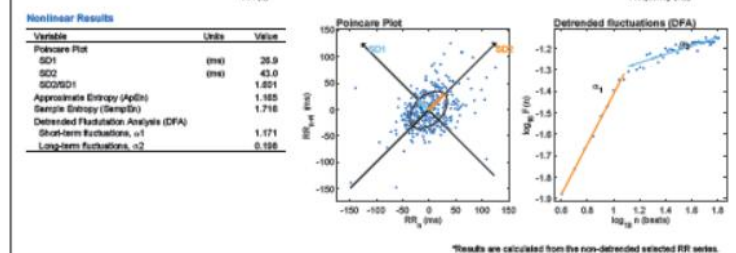
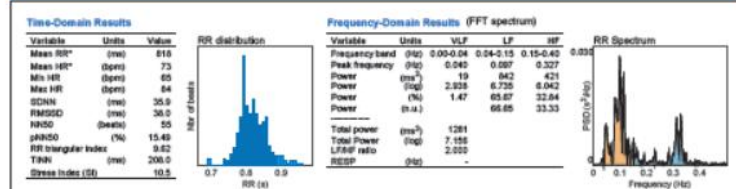
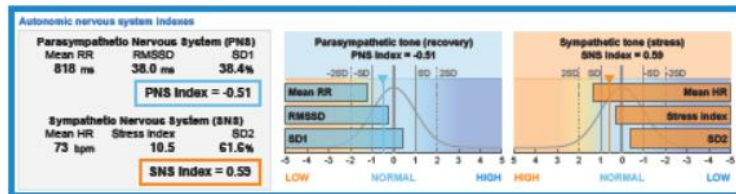
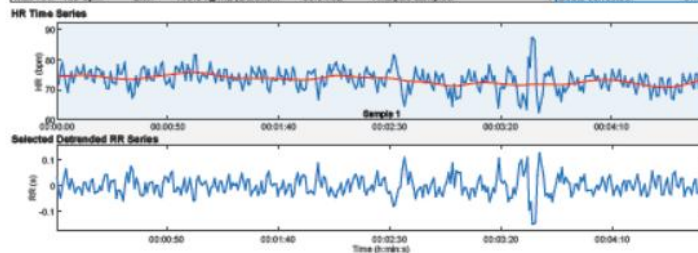
Breathing Interventions

3. Stress management-Complex

HRV Analysis Results

IBI Story 1 Kamau Johnson.tst - xcxofcx - xcxofcx Page 1/1

Person: HPI		Measurement Info		Results for Sample	
Gender:	Male	Date:	cxofcx	Trend removal:	Smoothed prices
Age:	-1 years	Start time:	00:00:00	Artefact corr.:	Threshold (medium)
Height:	100 cm	Duration:	00:04:52	Analysis samples:	1
Weight:	100 kg			Sample start:	00:00:01
Max HR:	100 bpm			Sample length:	00:04:52
BMI:	100.0 kg/m ²			Beats corrected:	Uncorrected



HPI-Gevirtz HRV Protocol:

☐ HRV Assessment (Kubios):

☐ ANS flexibility:

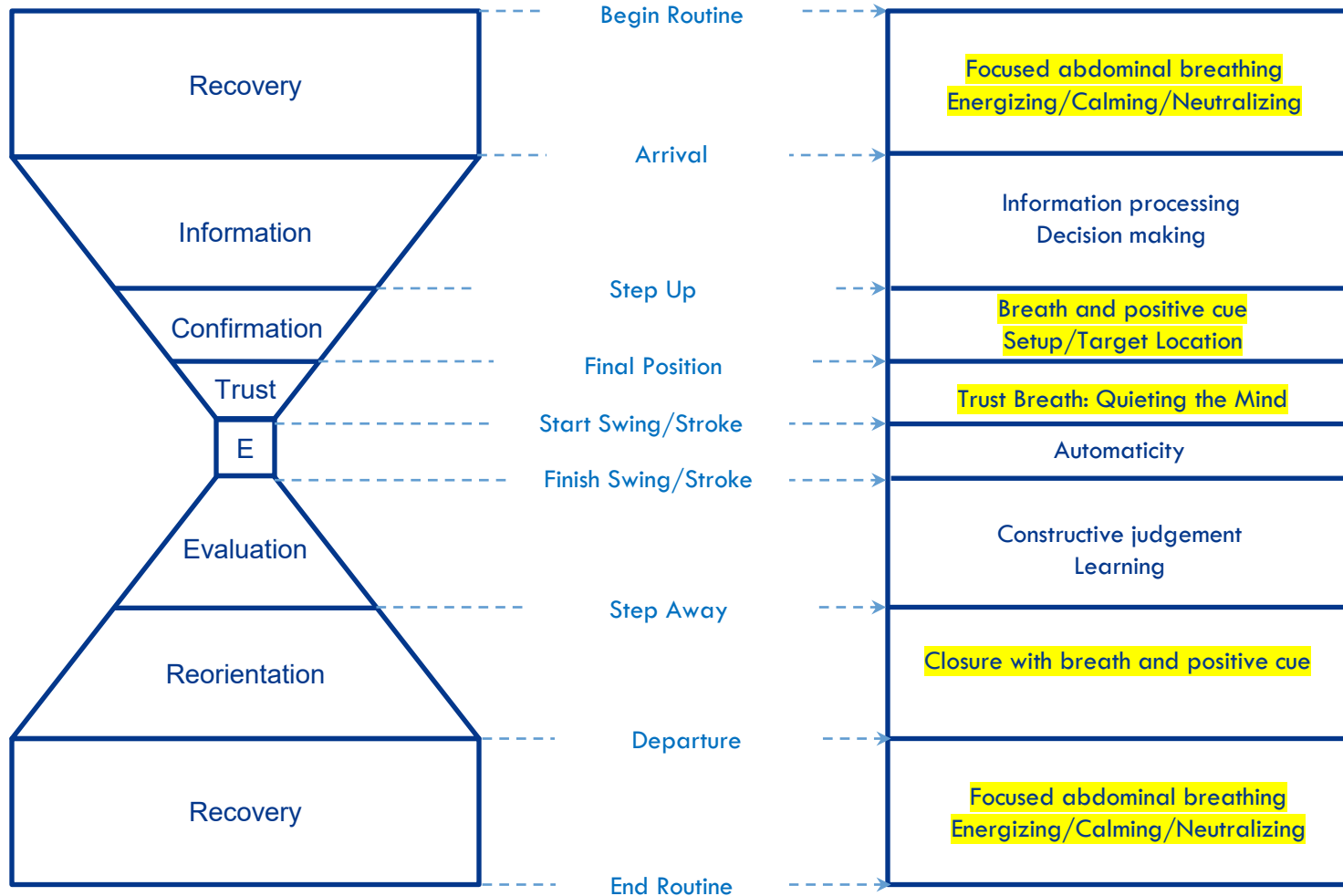
- SDNN (35-100)
- RMSSD (30-100)

☐ Vagal "Tone":

- Ln HF (4.5-7.5)

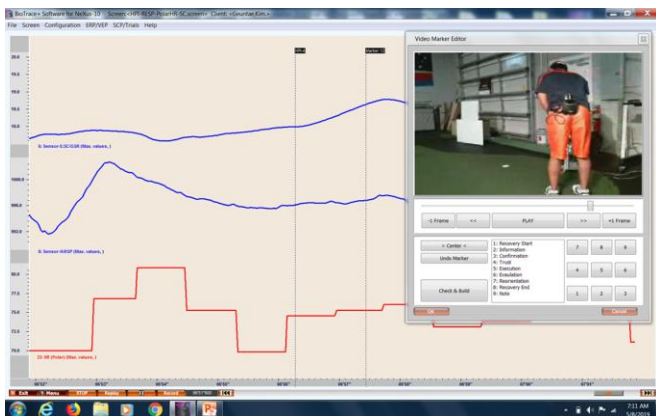
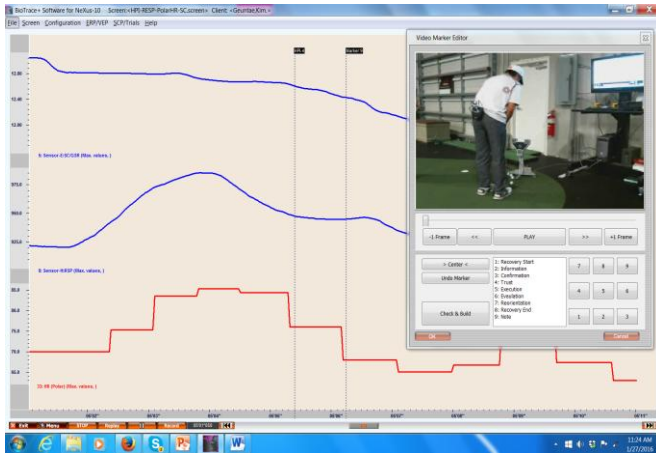
Breathing Interventions in Golf

4. Routine Training



Breathing Interventions in golf

5. Trust Breathing



- Training: Individualized Optimal Trust Breath Pattern
- Optimal Trust Breath Profile:
 - Expiration
 - Lower SC
 - Lower HR
- Proper Focus and Relaxation
- Goal: Optimizing preparation for automated execution of the stroke or swing

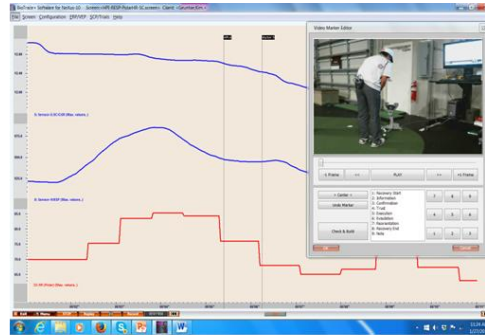
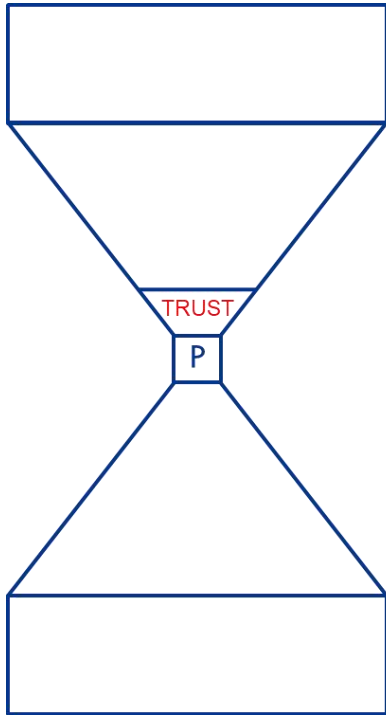
Breathing interventions in golf

5. Trust Breathing: Research project

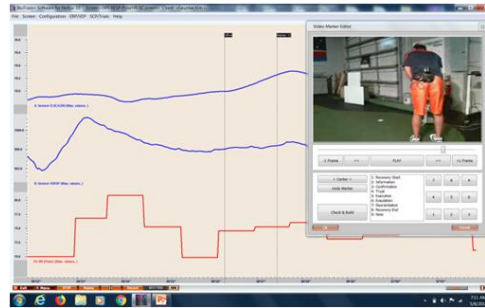
- Participants
 - 5 Junior golfers at IJGA
 - 3 skill levels: Advanced (2), Intermediate (2), Novice (1)
- Instrumentation:
 - Indoor putting green (4 putting distances, 3-9-12-15Ft)
 - SAM PuttLab
 - Telemetric biofeedback application
- Procedure
 - Automaticity protocol: 32 putts total, 4 series of 8 consecutive putts at the same (closed) hole
 - Routine protocol: 12 putts total, random strategized 3 putts at each (open) hole
 - 3 pre- and 3 post intervention assessments
 - Intervention: Individualized breathing pattern ending with an exhalation during the trust phase
- Measures
 - Performance process:
 - Mental preparation (Physiology during Trust Phase)
 - Skill execution (SAM PuttLab during Execution Phase)
 - Performance outcomes:
 - Distance (Automaticity)
 - In/out Hole (Routine)

Breathing interventions in golf

5. Trust Breathing: Research project



Good Trust



Poor Trust

□ Results across all skill levels:

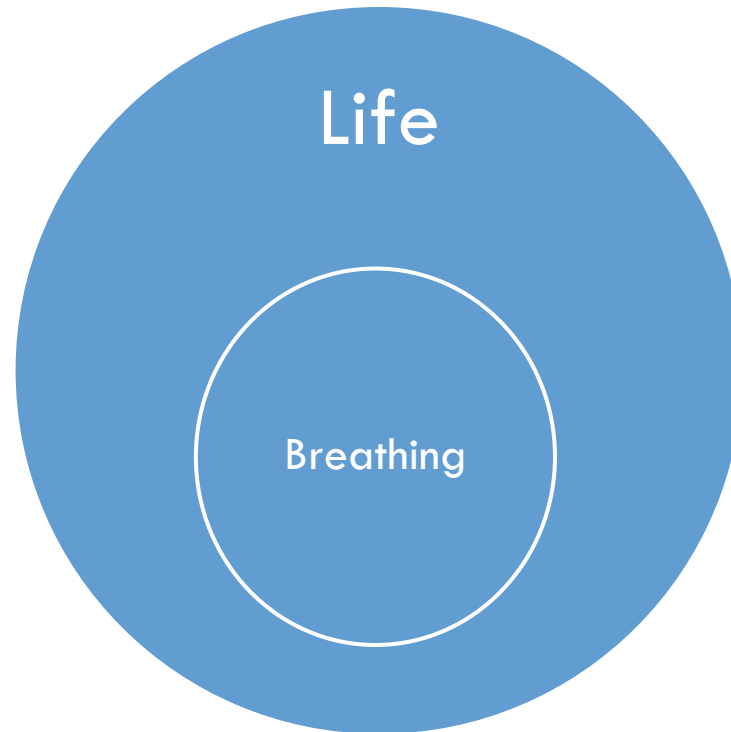
- Improved overall Trust Profiles and putt executions (process)
- Improved average putting scores (outcomes)

General breathing interventions in Golf

- ▣ Pre-competition
 - Imagery breathing (positive and negative)
 - Centering breathing
- ▣ Post-competition
 - Relaxed focused abdominal breathing
 - Mindful breathing
- ▣ Sleep hygiene
 - Relaxed focused abdominal breathing
 - Mindful breathing

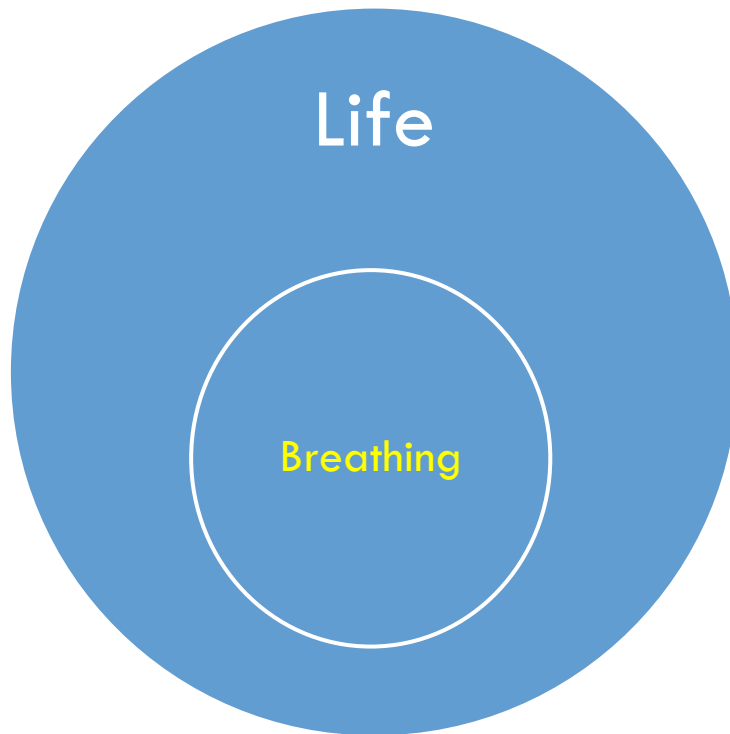
- ▣ Daily breathing sessions at different breath rates

3. Spirunion Model™ : Introduction



Spirunion Model™

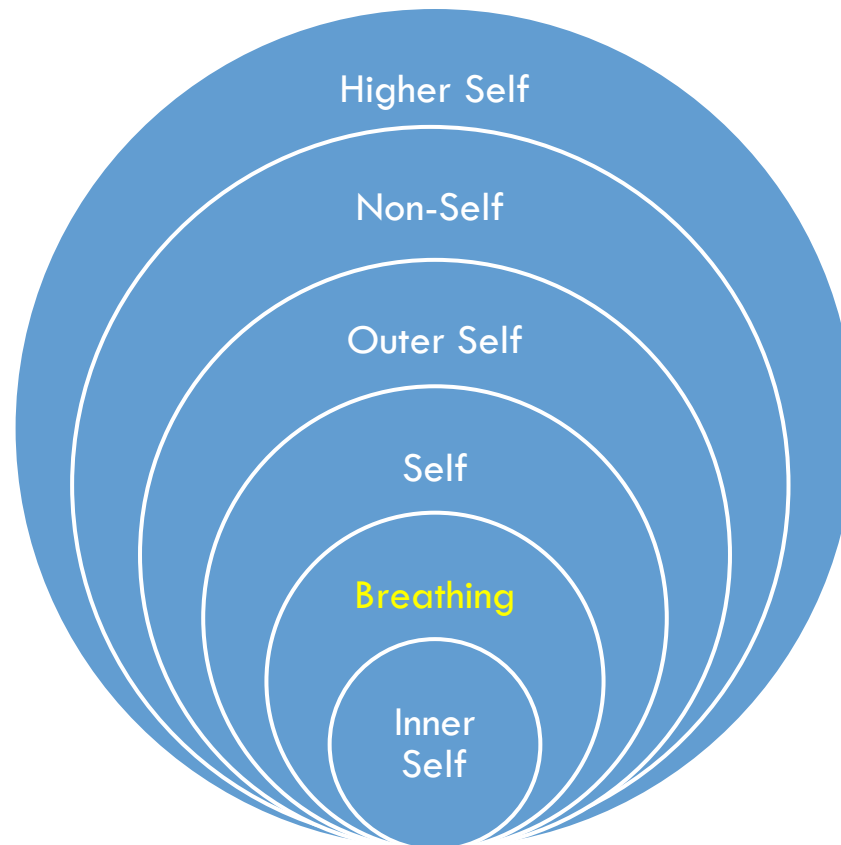
Introduction



❑ Spirunion...?

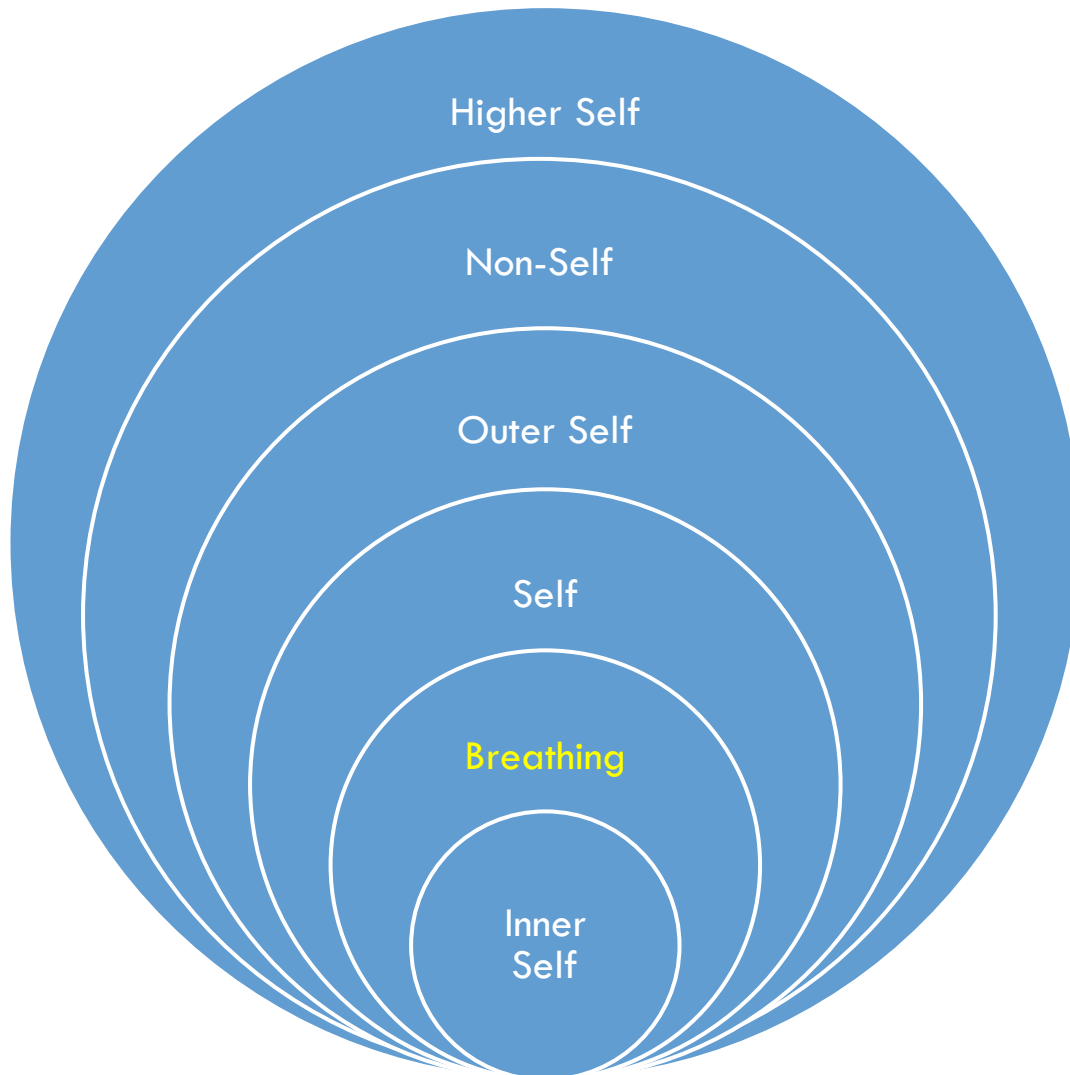
- Latin root word "spir" means "breathe"
- Latin word "unio" means "oneness" or "unity"
- Breathing is connected with life!

3. Spirunion Model™ : Breath connections with the “Layers of Life”



Spirunion Model™:

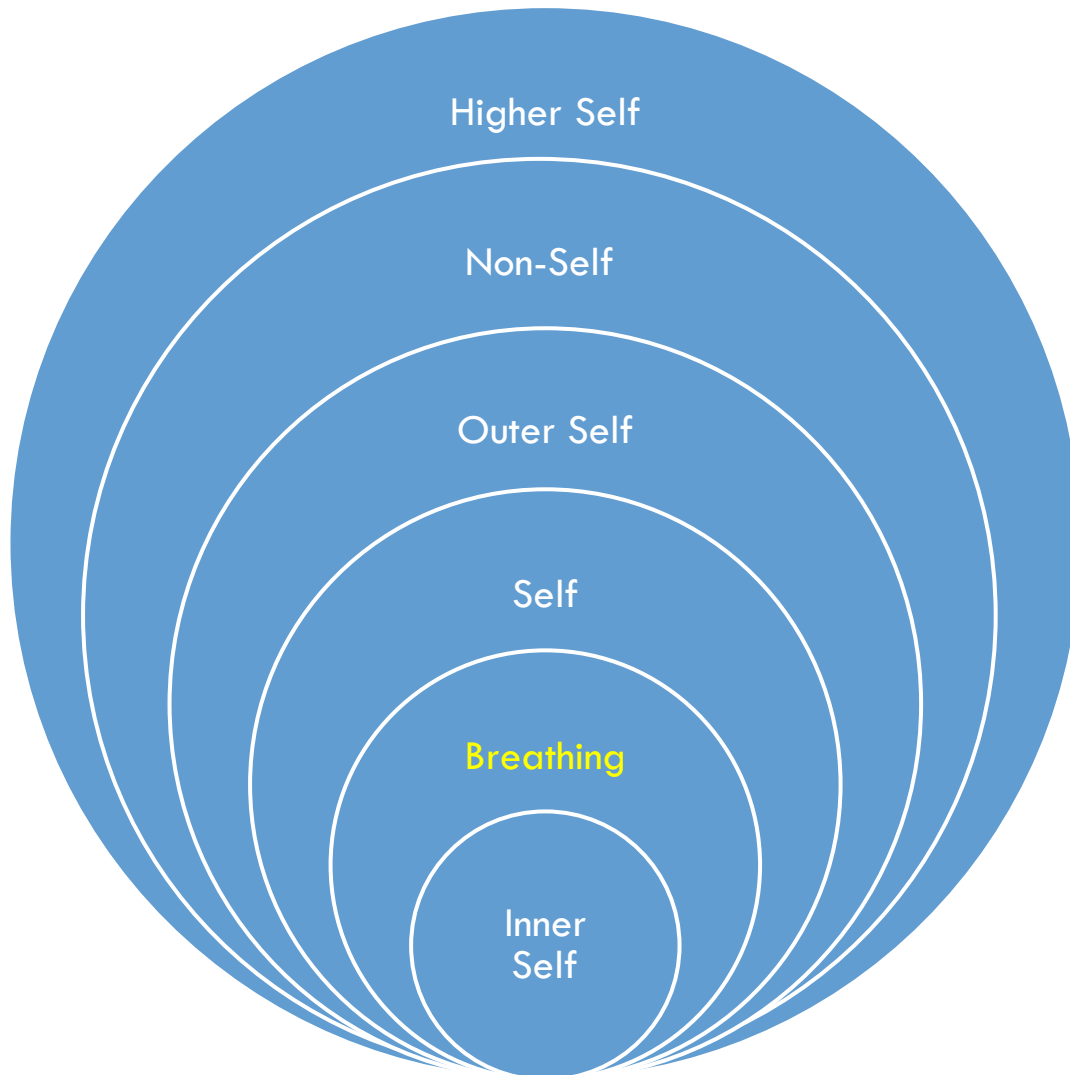
The “Layers of Life”



- **Higher Self:**
The big picture in life
(god/universe)
- **Non-Self:**
Family, friends
Social Media
- **Outer Self:**
Behavior
Authenticity
- **Self:**
Identity/Ego
Emotions, feelings, thoughts
- **Inner Self:**
Purity
Simplicity

Spirunion Model™

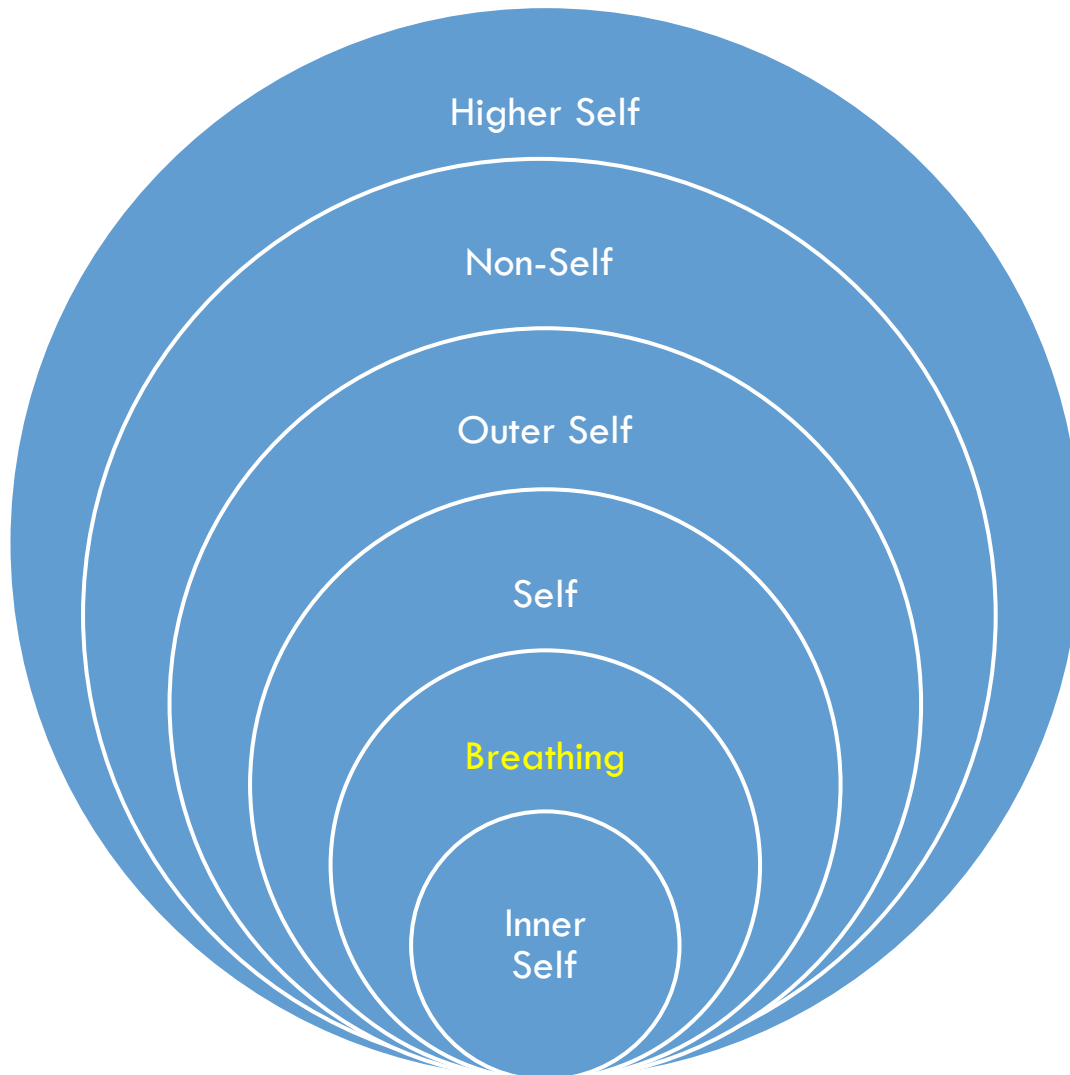
Compromised “Layers of Life”



- **Higher Self:**
Not seeing big picture perspective, purpose in life
- **Non-Self:**
External stress and trauma.
Expectations.
Misinformation. Loneliness
- **Outer Self:**
Anti-social and self-destructive behavior
- **Self:**
Fragile Ego
Poor cognitive and emotional regulation
- **Inner Self:**
Estranged or lost

Spirunion Model™

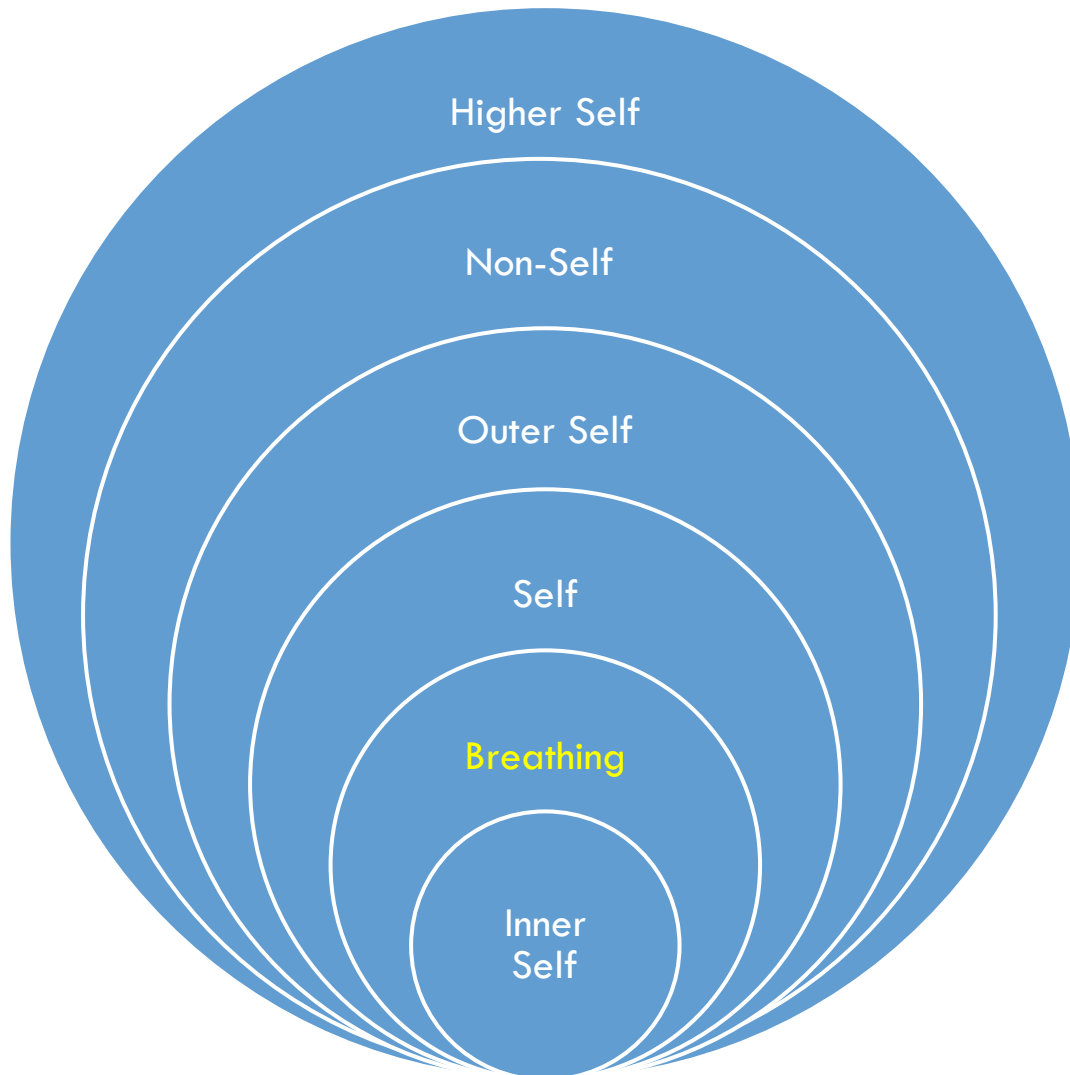
Breathing applications with the “Layers of Life”



- Higher Self:
 - Mindful breathing
 - Pre-prayer breathing
- Non-Self:
 - Mindful breathing
 - Focused abdominal breathing
- Outer Self:
 - Mindful breathing
 - Focused abdominal breathing
- Self:
 - Mindful breathing
 - Focused abdominal breathing
 - Body scan breathing
- Inner Self:
 - Mindful breathing
 - Focused abdominal breathing
 - Heart focused breathing

Spirunion Model™

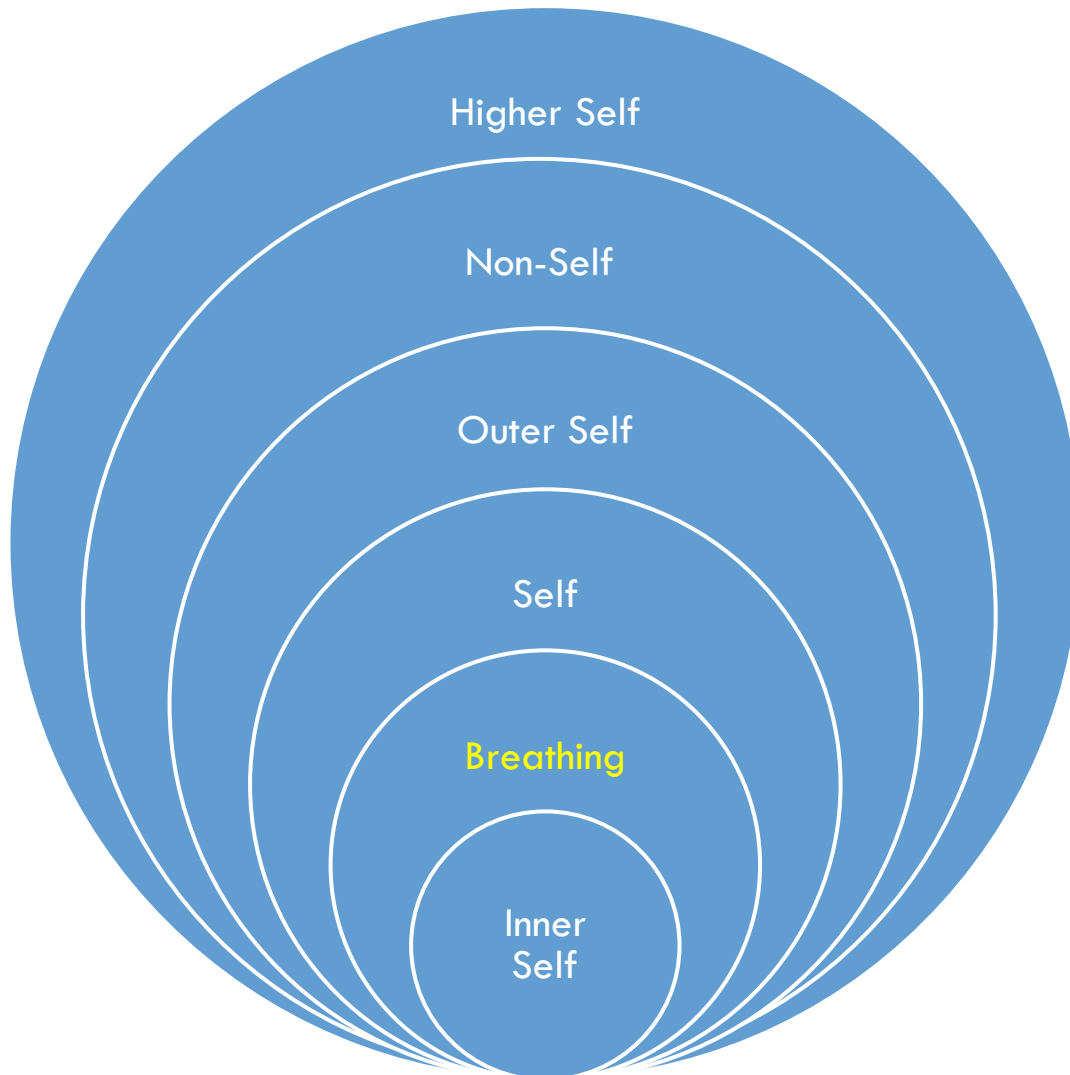
Breathing connections: Neuro/Biofeedback



- Breathing can be very helpful to enhance treatment outcomes in the field of Neuro/Biofeedback
- Powerful influence on the neuro physiology in the “Self” (i.e., polyvagal theory)

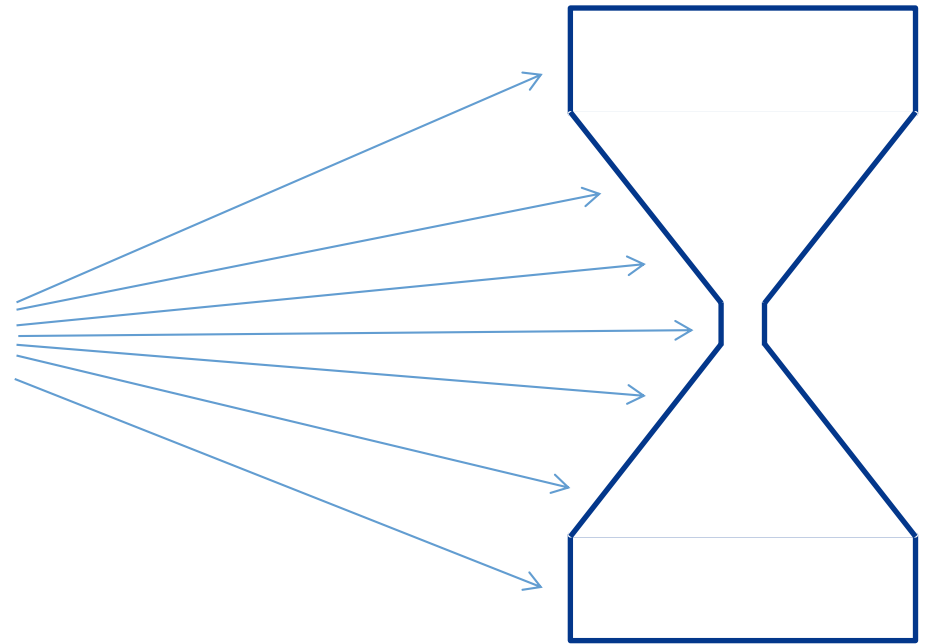
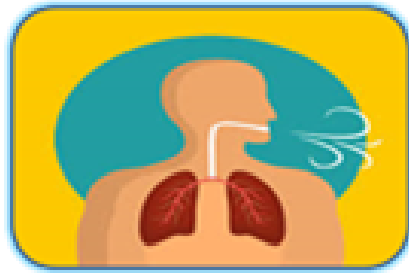
Spirunion Model™

Summary



- Quality connections between the “Layers of Life” are fundamental to optimize our daily performance, health, and well-being.
- Breathing can be a very powerful tool to (re-) connect our “Self” and all the other “Layers of Life”!

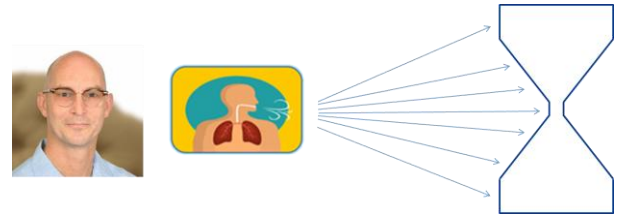
4. Practice what you preach...



Breathing

Practice what you preach...

- Mindful breathing (home)
- Recovery breathing (work)
- Monitored breathing (sport)
- Exposure breathing (cold/hot)
- Performance breathing (BPM)
- Focused breathing (sleep)
- Trust breathing (target tasks)



With a little help from my...





Thank you and be one with your breathing!