



**2022 NSCA TACTICAL ANNUAL TRAINING** #NSCATactical22

# *CONFLICT OF INTEREST STATEMENT*

I have no actual or potential conflict of interest in relation to this presentation.

# *DISCLAIMER STATEMENT*

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# Performance Under Threat: Lessons Learned from SOF

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# Objectives

- Understanding of the Psychophysiology under extreme threat
- Mitigation of the Psychophysiological effects
- Application to Law Enforcement

# Special Operations Forces

What we already knew:

*Training...Exposure*

*Training...Exposure*

*Training...Exposure*

*BLUF*

*Time on task & Exposure*

# Special Operations Forces

## Historical RDT&E

### Assessment & Selection

Data collection during selection process

- Physiological
  - *HR, Resp, HRV, acceleration, etc.*
- Psychological
  - *Psychological assessment batteries*
- Performance
  - *Shooting, CQB/CQC, Helo Ops, fast roping, maritime, HAHO, HALO, INFIL, EXFIL, etc.*

# Special Operations Forces

## Operational

Data collection during selection process

- Physiological
  - *HR, Resp, HRV, acceleration, etc.*
- Psychological
  - *Psychological assessment batteries*
- Performance
  - *Shooting, CQB/CQC, Helo Ops, fast roping, maritime, HAHO, HALO, INFIL, EXFIL, etc.*

# Special Operations Forces

## What we learned:

Heart Rate Variability (HRV) – PRE & POST Tactical Activity

- HRV returned to baseline post activity
- HRV highly correlative to performance objectives
- HRV highly correlative to Psychological Assessments

*BLUF*

*Those who are able to modulate their stress were more likely to be successful in tactical performance.*

# Special Operations Forces

What we learned:

Psychophysiological Load is relative to the amount of Recovery

Recovery

- Recovery interventions
- Mindfulness
- *Biofeedback*

$$\Omega/\xi = \Sigma$$

*BLUF*

*Those who incorporate recovery techniques saw an increase in perceived sleep quality and time.*

# Special Operations Forces

## Adaptability

### Tactical Training Performance

- *Heart rate increases, becomes very uniformed with little variability*
- *Respiration increases but is consistent, becomes rapid & full*

### Post Tactical Training Performance

- *HRV returns or exceeds baseline values within 5-10 minutes*
- *Respiration decreases, consistent full breaths*

# Special Operations Forces

## Inadaptability

### Tactical Training Performance

- *Heart rate increases, becomes very uniformed with little variability*
- *Respiration increases and is inconsistent, becomes rapid & shallow*

### Post Tactical Training Performance

- *HRV does not return to baseline values within 5-10 minutes (30+)*
- *Respiration decreases, remains inconsistent and shallow (chest breathing)*

# Psychophysiology Under Threat: Stress

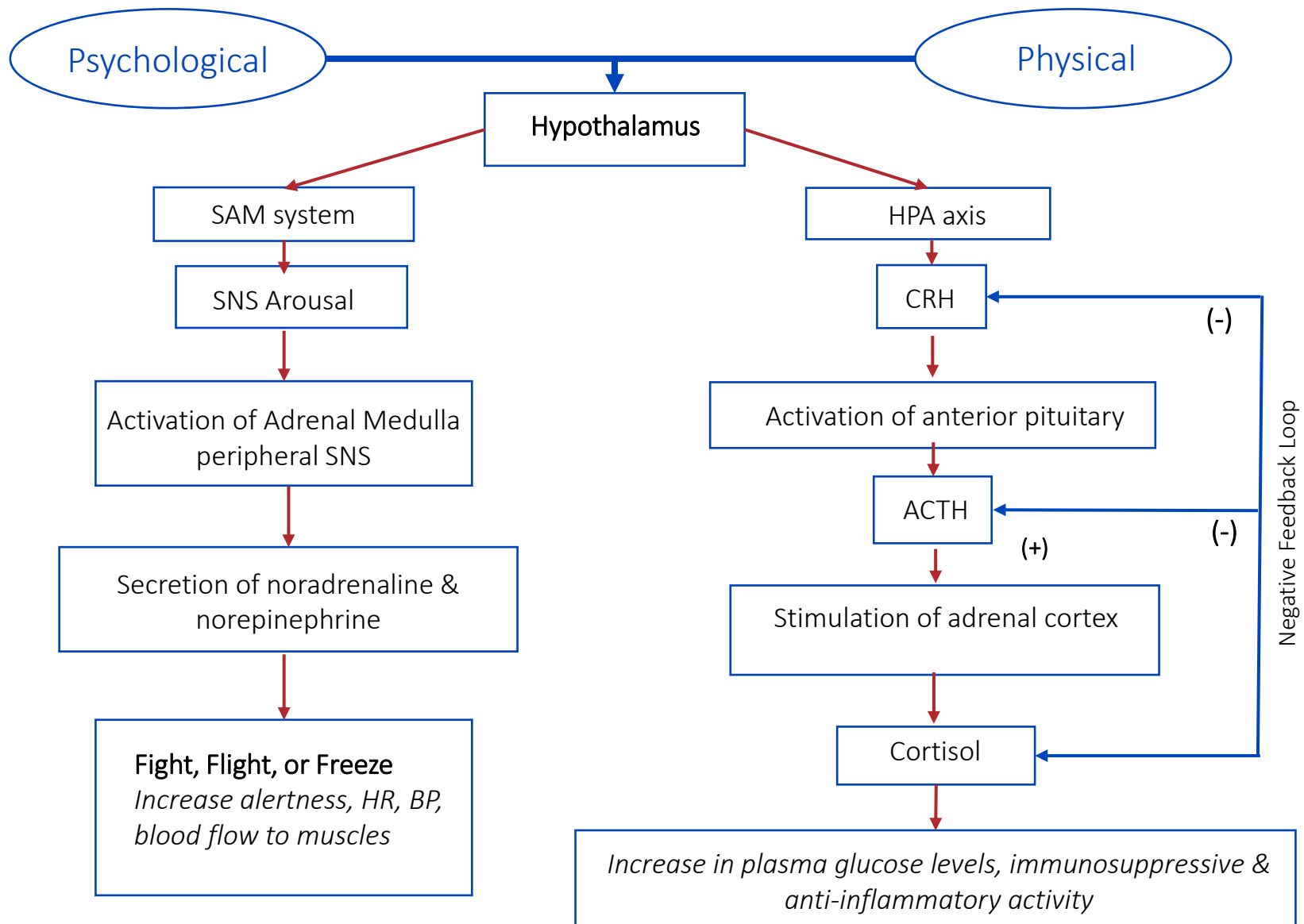
- Hypothalamus
- Sympathetic Adreno Medullar System (SAM)
  - *Noradrenaline, Norepinephrine*
- Hypothalamus Adrenal Pituitary Axis (HPA)
  - *Glucocorticoids*

# The Brain's Perception is the Body's Reality!

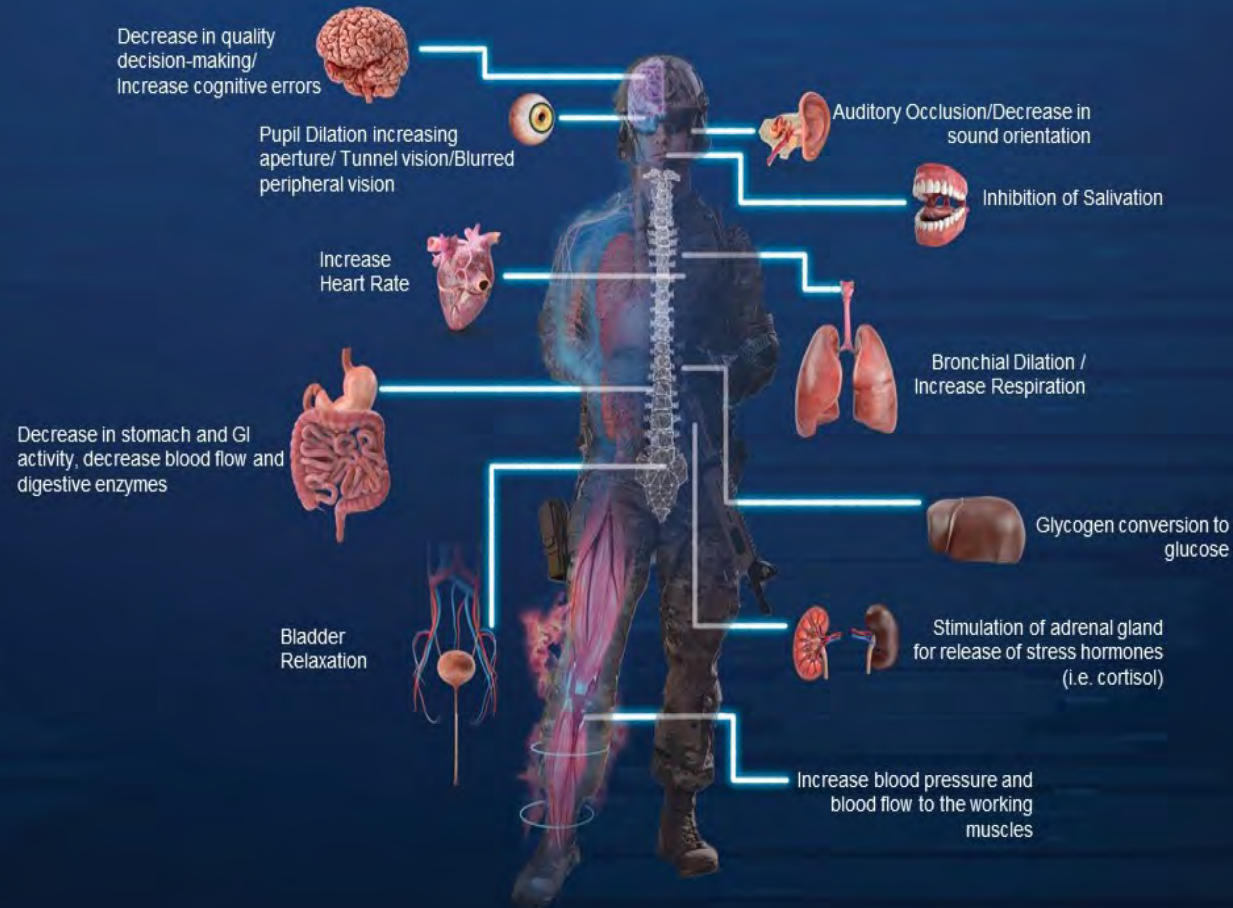


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## Psychophysiological Effects of Acute Stress



Stephenson et al., 2022

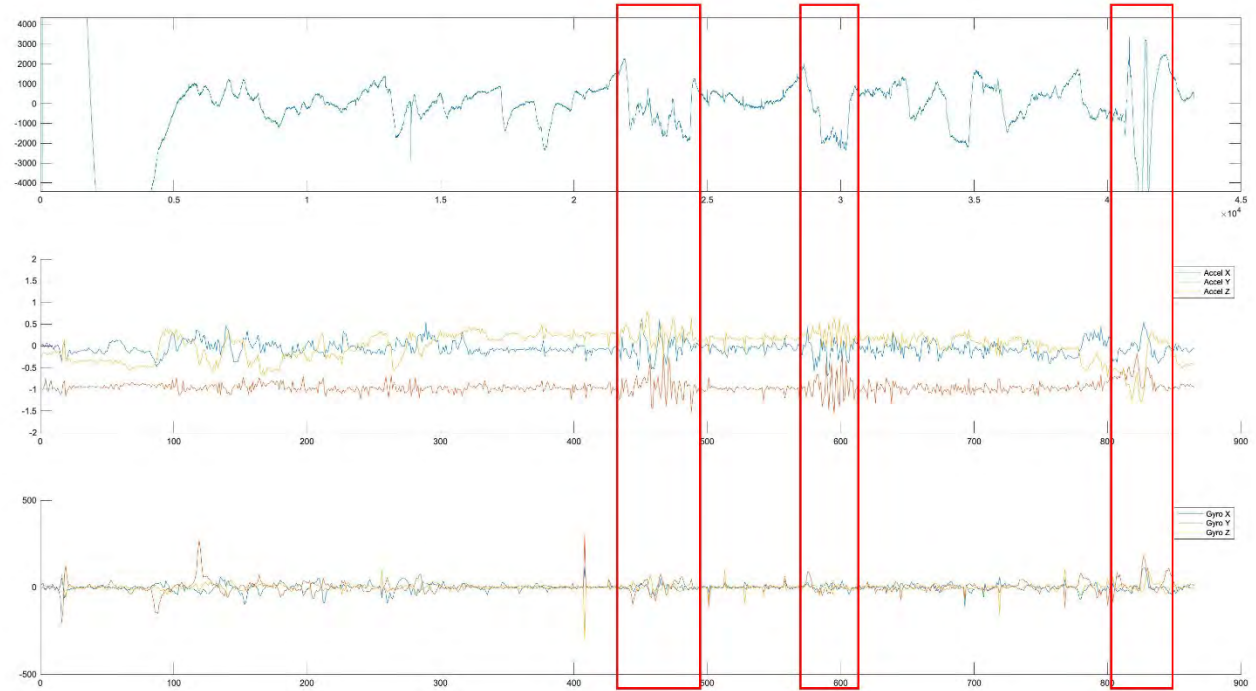
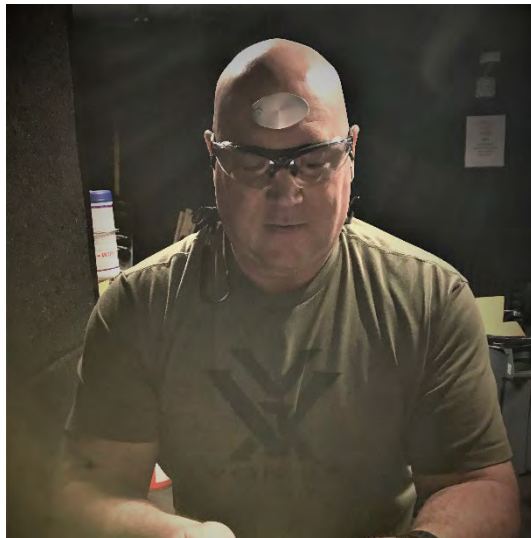
# Threat Rigidity

*“...the tendency to rely on well-learned or dominate responses in reaction to threat or extreme stress.”*

*- Staw, B.M., Sandelands, L.E., & Dutton, E. (1981)*



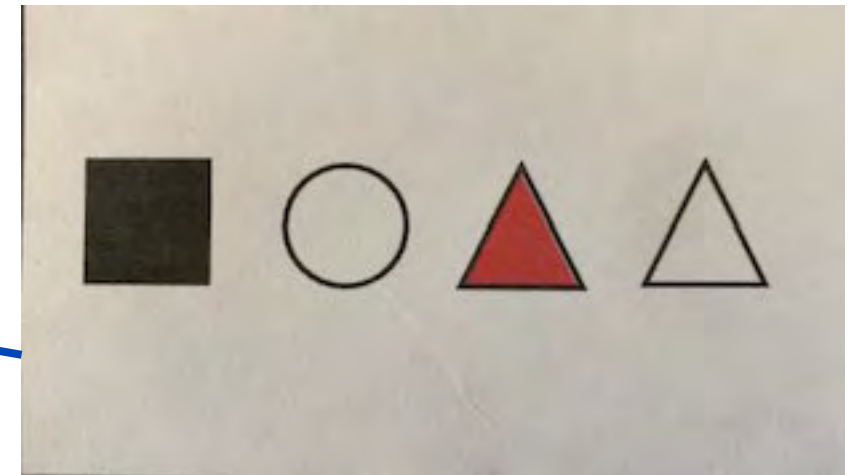
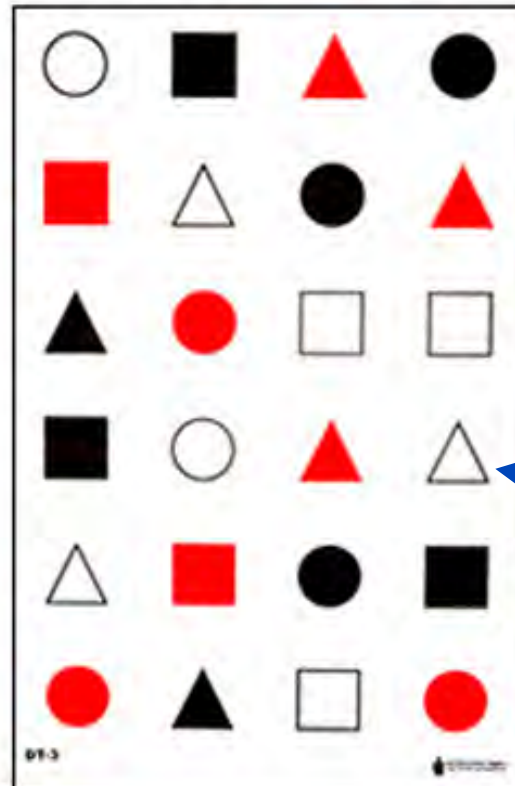
# Wireless EEG monitoring during performance assessments



## WORKING MEMORY

Symbols Sequence

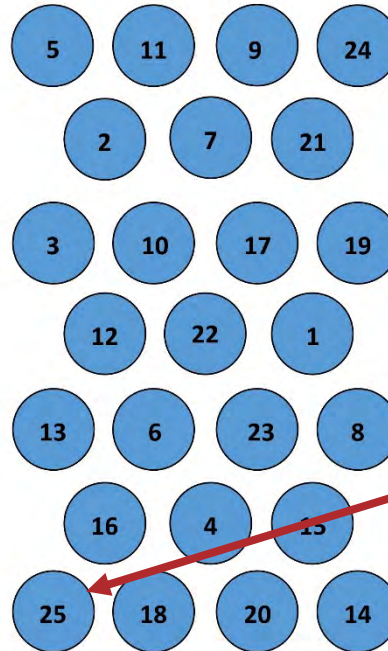
Action: Fire 1 round at each symbol in the sequence they appeared, for time.



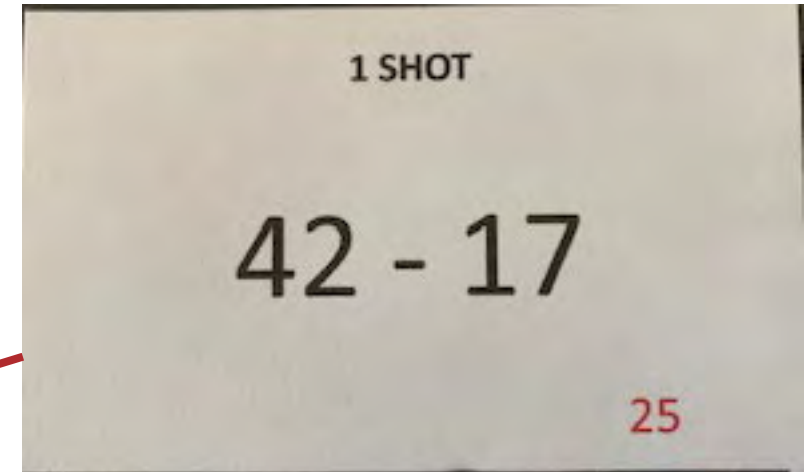
# MATH

Simple Equations

Action: Fire 1 round at each answer, for time.



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# Simulation Training

- Increase the number of exposures under stressful conditions.
- Increase complexity over time.
- Document performance metrics.

The manipulation of both time and distance will push the CNS to perform beyond typical capabilities.



# “Hardiness is the result of consistent hard efforts”

“Experience does not equal mastery...”

“10,000 hours is not a rule...deliberate or purposeful practice is.”

-Anders Erickson

- Train under stressful conditions...both physically and mentally.
- Deliberate practice must push you outside your comfort zone.
- Skill requires deliberate practice.

# Application

## Minimum Resources required

- Add time component to your training
- Add cognitive load to your training
- Incorporate breathe work
- Incorporate Mindfulness & Meditation



**Get outside your comfort zone!!**

# References

Stephenson, M. D., Schram, B., Canetti, E. F. D., & Orr, R. (2022). Effects of Acute Stress on Psychophysiology in Armed Tactical Occupations: A Narrative Review. *International Journal of Environmental Research and Public Health*, 19(3), 1802. <https://doi.org/10.3390/ijerph19031802>

Cooper, D., Fuller, J., Wiggins, M. W., Wills, J. A., Doyle, T., & Main, L. C. (2022). Negative Consequences of Pressure on Marksmanship May be Offset by Early Training Exposure to Contextually Relevant Threat Training: A Systematic Review and Meta-Analysis. *Human Factors*, 0(0), 00187208211065907. <https://doi.org/10.1177/00187208211065907>



# THANK YOU!



## Mass General Brigham



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