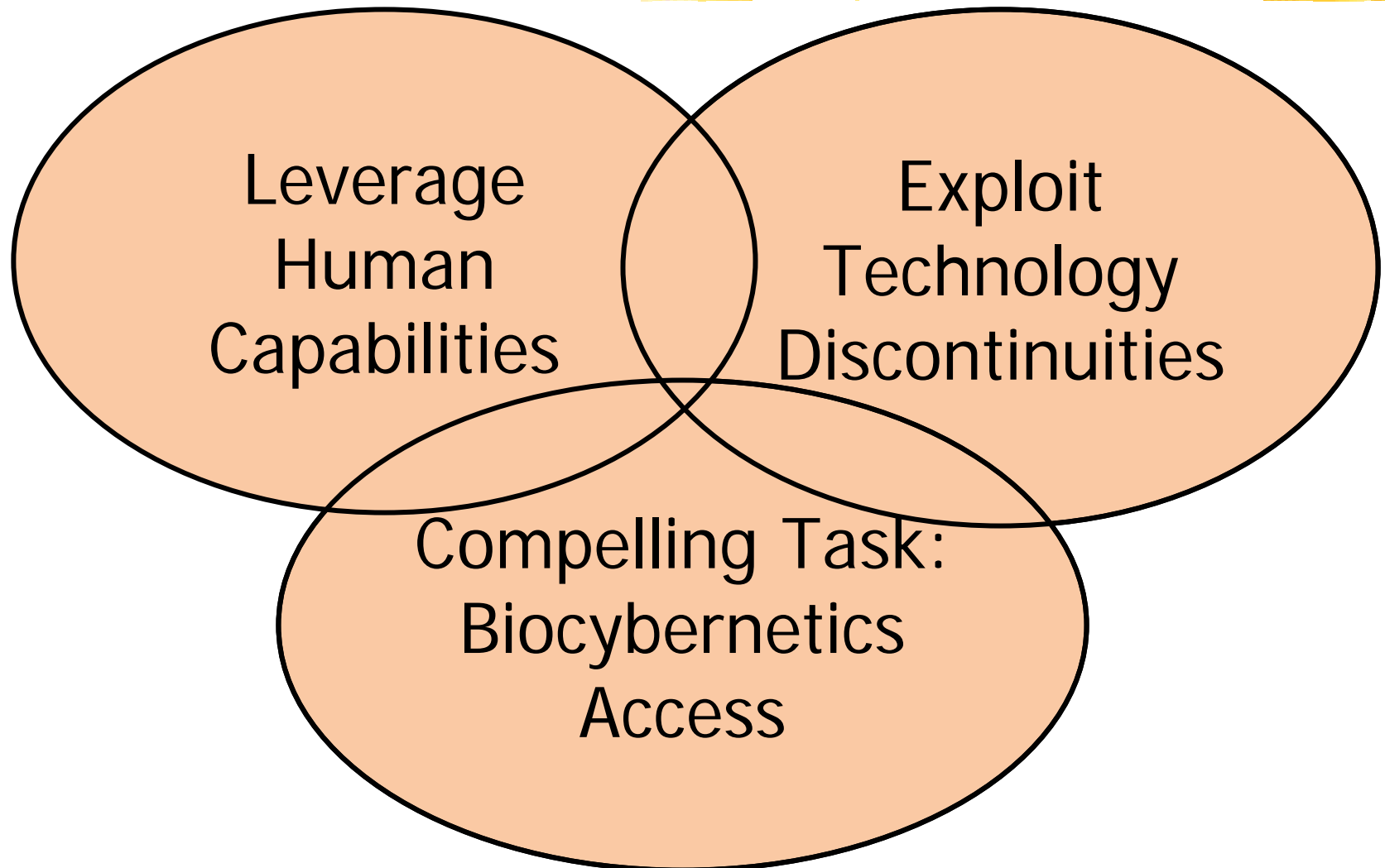



Aroused and Immersed: Introducing “virtual pain” into an extreme team training experience



Ioannis, A. Tarnanas
Aristotle University of Thessalonica

Research Strategy

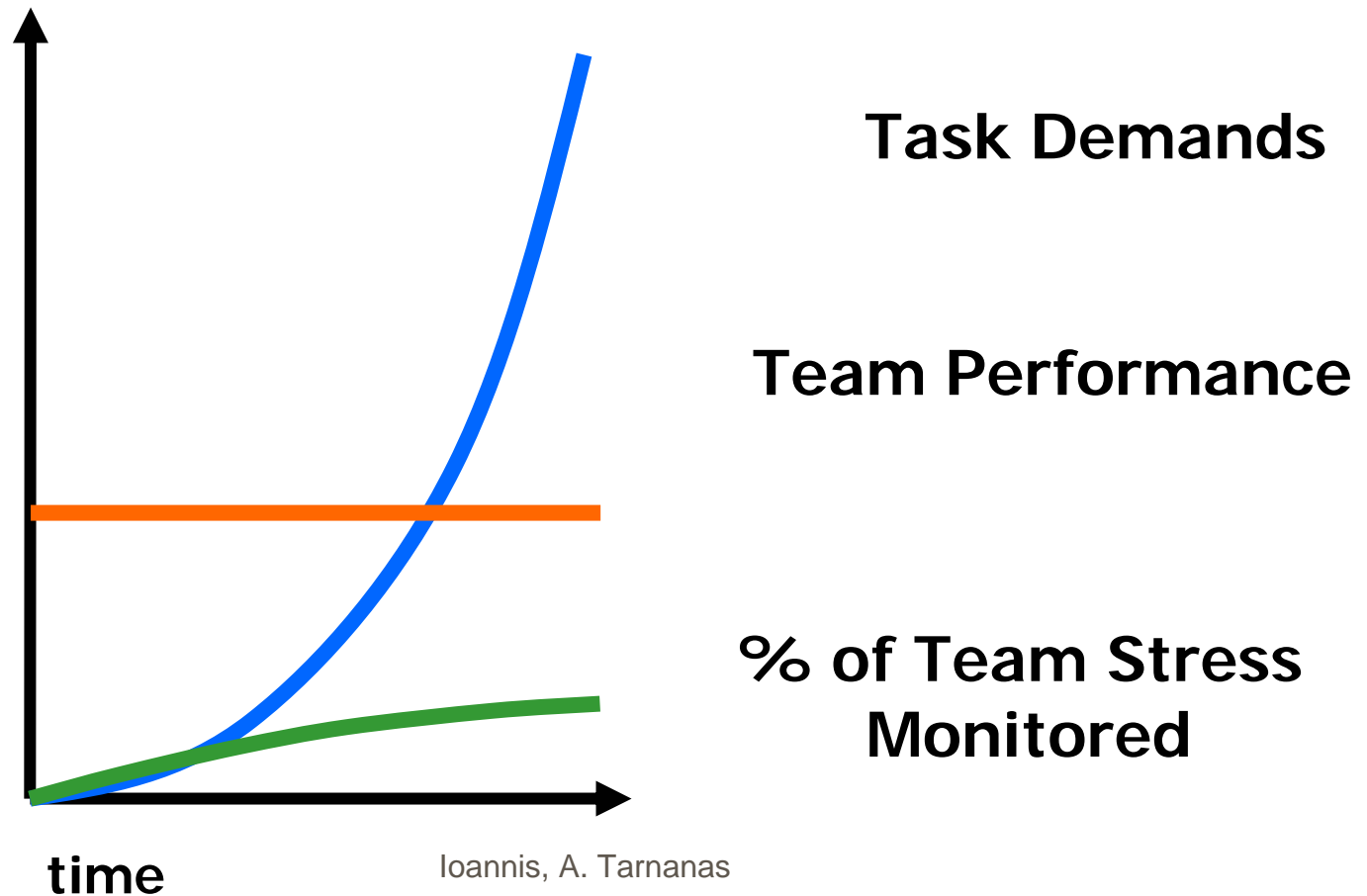


What are biocybernetics



- ⌘ Biocybernetics approaches for promoting human-system compatibility continuously adjust the challenge level of a task to match the available resources of the human operator based on his/her psycho physiological state.
- ⌘ This project expands the scope of biocybernetics to teams.

Match Team Biocybernetics



Team Biocybernetics at a Demanding Task



⌘ Task

☞ Secure or

⌘ Mission

☞ Dispose or

⌘ Sensation

☞ Dismantle a progressively

⌘ Stress

more demanding set of

⌘ Cognition

virtual explosives inside

10 virtual rooms

Team Biocybernetics at a Demanding Task



⌘ Task

☞ 8 missions during 2 days

⌘ Mission

☞ Teams of two persons
with

⌘ Sensation

☞ Verbal Communication
enabled inside the Virtual
Environment

⌘ Stress

⌘ Cognition

Team Biocybernetics at a Demanding Task



⌘ Task

⌘ Mission

⌘ Sensation

⌘ Stress

⌘ Cognition

👉 Tactile feedback

👉 Physical HRV

responses

Team Biocybernetics at a Demanding Task



⌘ Task

☞ Small amounts of stress

⌘ Mission

helped the team performance

⌘ Sensation

over the missions

⌘ Stress

☞ Large amounts of stress

⌘ Cognition

slowed down the performance

Team Biocybernetics at a Demanding Task



⌘ Behavior

⌘ Affect

⌘ Sensation

⌘ Stress

⌘ Cognition

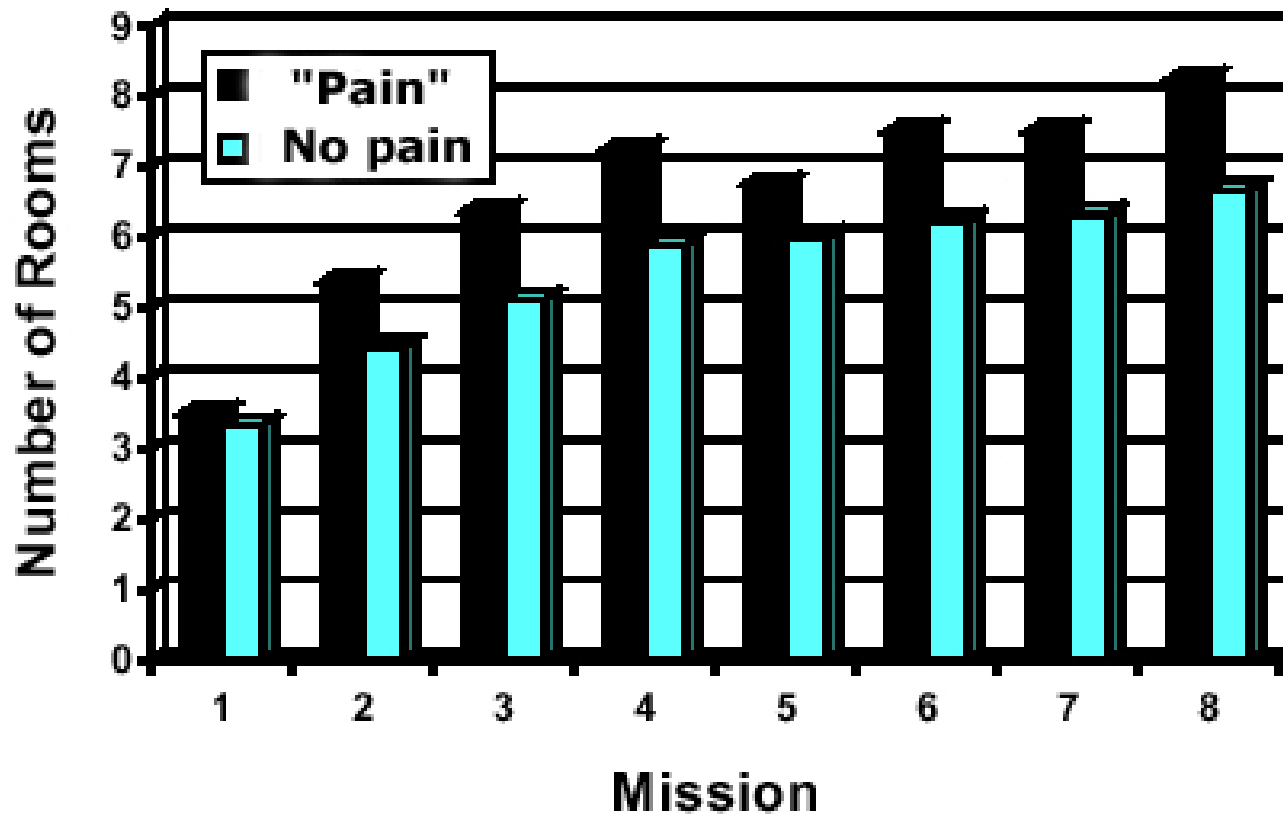
☞ Rehearsal

☞ Coping skills

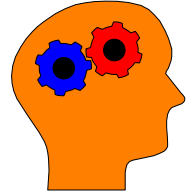
☞ Reduce errors

☞ Higher awareness

The Results



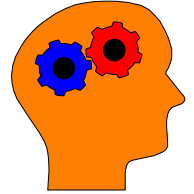
Training Sessions



- ⌘ On day 1 of the study, subjects received classroom training and familiarization training with the simulation
- ⌘ For the “No Pain” group, these trials were undertaken with no *biocybernetics* enhancements
- ⌘ On day 1, subjects completed half of the practice missions



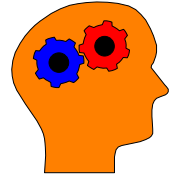
Training Sessions



⌘ On day 2 of the study, subjects completed the remaining practice missions

- ☞ Discoverability
- ☞ Collaborative coping skills
- ☞ Significant performance improvement for the *biocybernetics* group

Evaluation, assessment of three indices of learning:



- ⌘ Specific-mission learning: assessed by the improvement from Trial 1 to Trial 3 (averaged across rooms).
- ⌘ Near-transfer or general learning: assessed by the average performance on Trial 1 of the practice rooms on Day 1 compared to the average performance on Trial 1 of the practice rooms on Day 2.
- ⌘ Far-transfer learning: assessed by performance on the practice rooms compared to performance on the transfer rooms.

Conclusion:



- ⌘ The results of this study indicate that practice in the *biocybernetics* VE training simulation resulted in improved performance both within a specific mission and in transferring to a new mission.
- ⌘ The apparent links we saw between sensor data and human performance suggest to us that *biocybernetics* sensing in an extreme virtual team training scenario setting could be an incredibly promising technology.

Future design:

⌘ VTi CyberGlove &
Immersion Cyberforce
for *biocybernetic*
feedback

⌘ THANK YOU!

