

Fit to Fly Program



COGNITIVE RESILIENCE

EFFICIENT LEARNING – SAFETY

Origins of a Doctrine

2

- Mirage accidents:
 - ✦ Engine failure, a pilot ejects perilously low
 - ✦ Another pilot does not eject
- Investigator interest in DM, SA under stress, cognitive overload
 - Mid-80s – Review RAAF selection for flight training
 - Failure rate too high
 - Roscoe and SA under stress – safety and training benefits
 - Modify selection
 - Lower failure rate – few pilot error accidents

SA Prompts Decision

3



SA wrong, decision wrong



Get SA right for good decision

4



SA – Powers – TM + IP

5

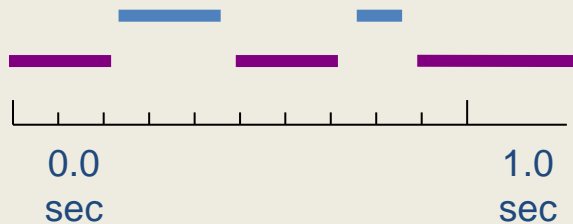
Situation Awareness

Time Management

+

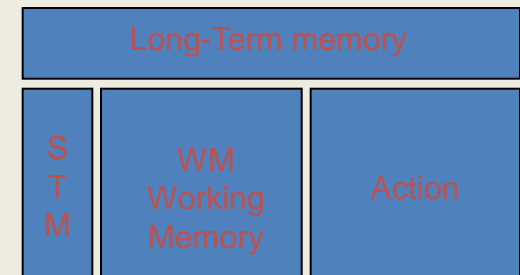
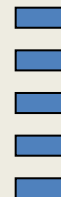
Information Processing

Time distributed multiplexing



Recognition-Perception Model

Senses



SA – Powers – TM + IP

6

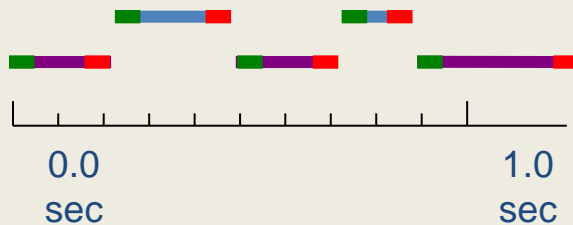
Situation Awareness

Time Management

+

Information Processing

“Virtual Channels”



SA – Powers – TM + IP

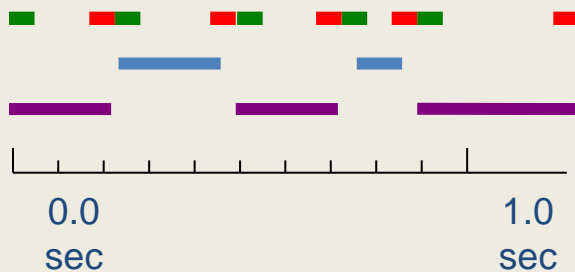
7

Situation Awareness

Time Management

+

Information Processing



(3, here, not 4)

SA – Powers – TM + IP

8

Situation Awareness

Time Management

+

Information Processing



Time Management

9

- Normal scan is random



Time Management

10

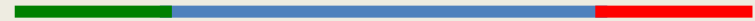
- Time-to-Attention Scan scan



Critical issue #1 – information rate

18 “bits” per sec max?

Learner



Competent

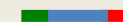


Runway



Attitude

Altitude



Descent rate



Time Management

11

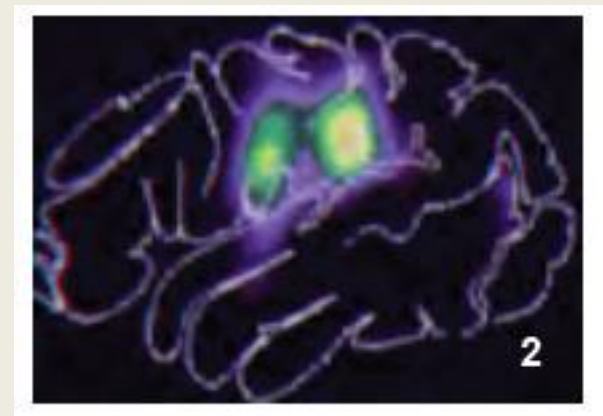
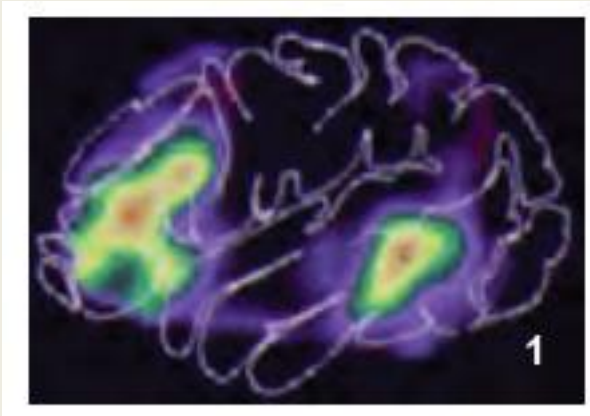
- Captured scan



Training
objective

Time Management – Slow/Fast

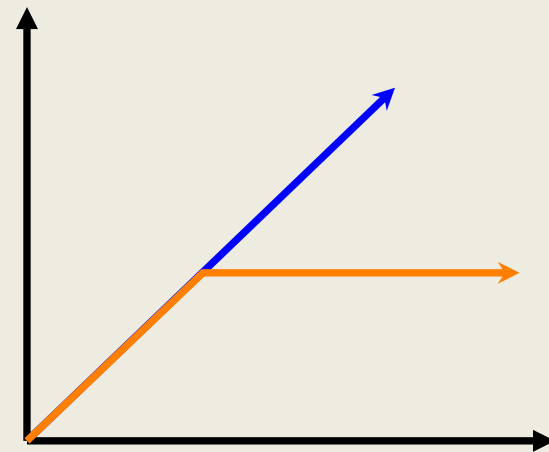
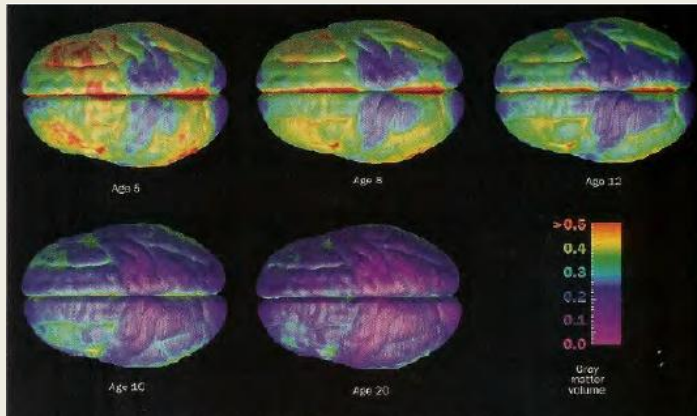
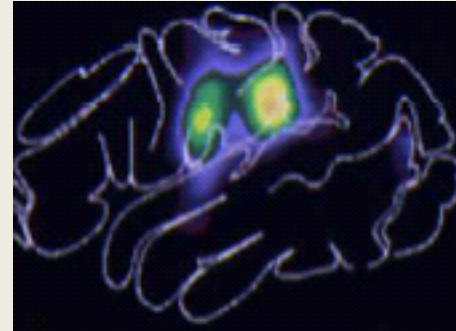
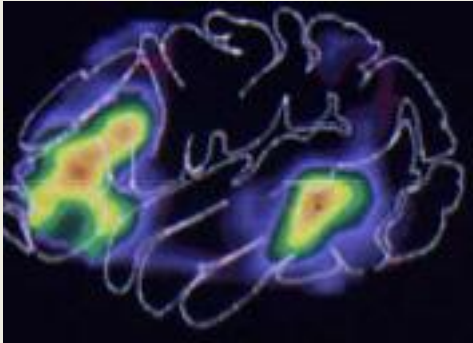
12



Learning skills – imprinting into the cerebral cortex

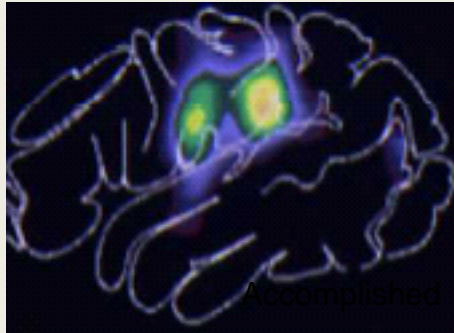
Stress and Learning

13

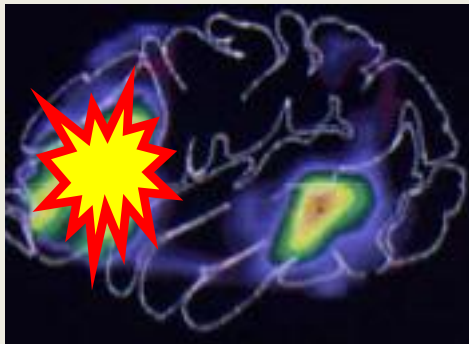


Stress and Skill Priority

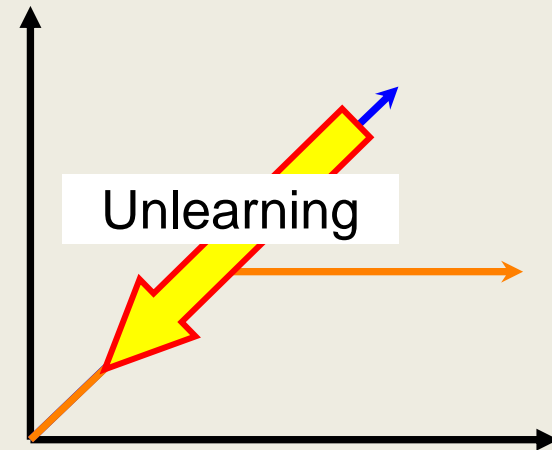
14



Relaxed

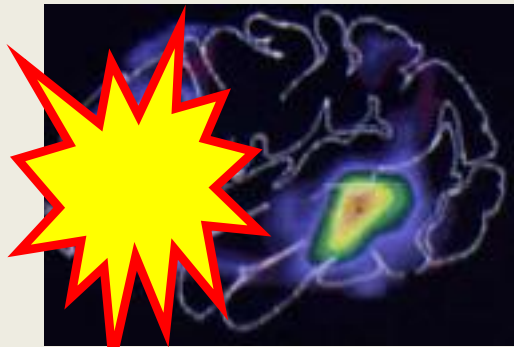


STRESSED

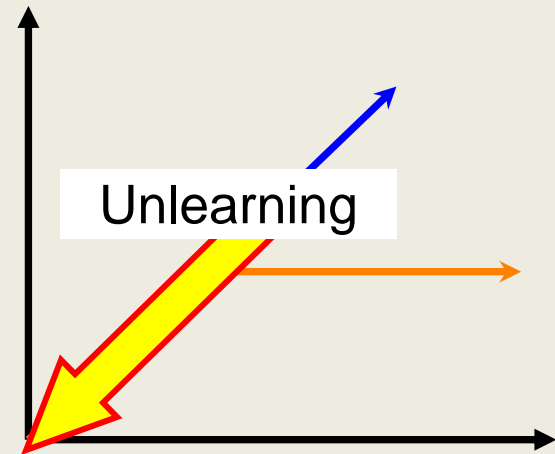


Stressed Out – No Skills

15

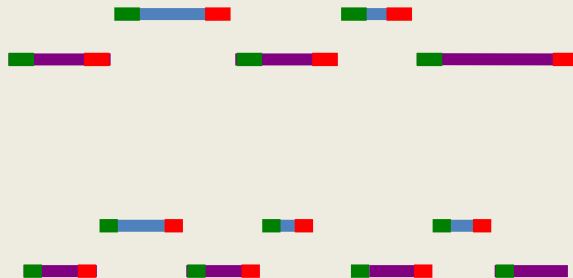
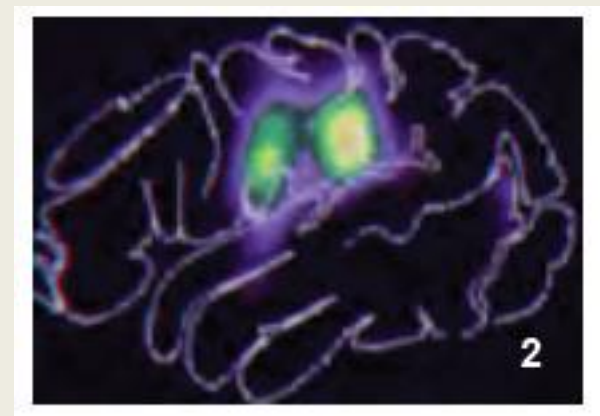
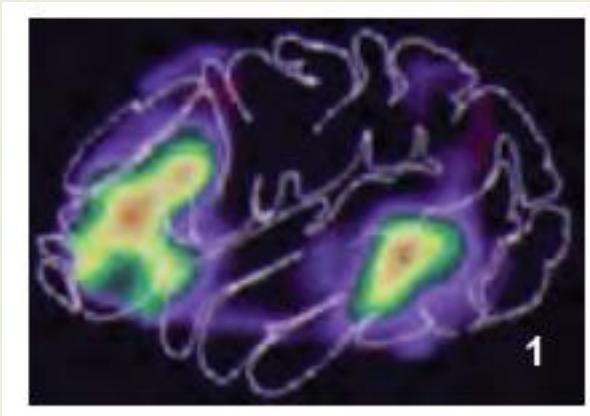


OVERSTRESSED



Cognitive Skills #1 – Time Management

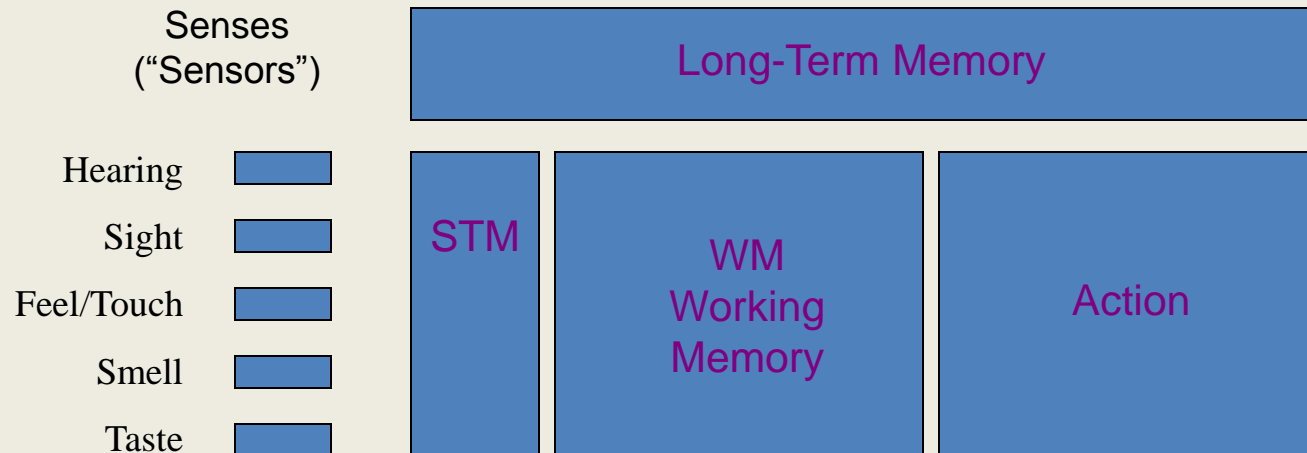
16



Train for max info rate – need to know the skills – TM seen, IP next

Information Processing

17



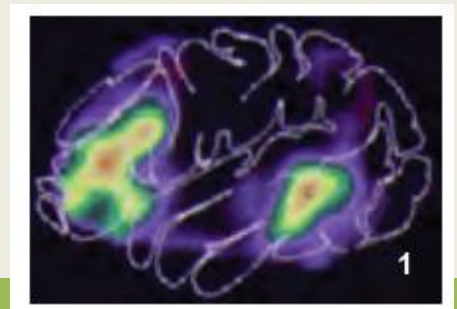
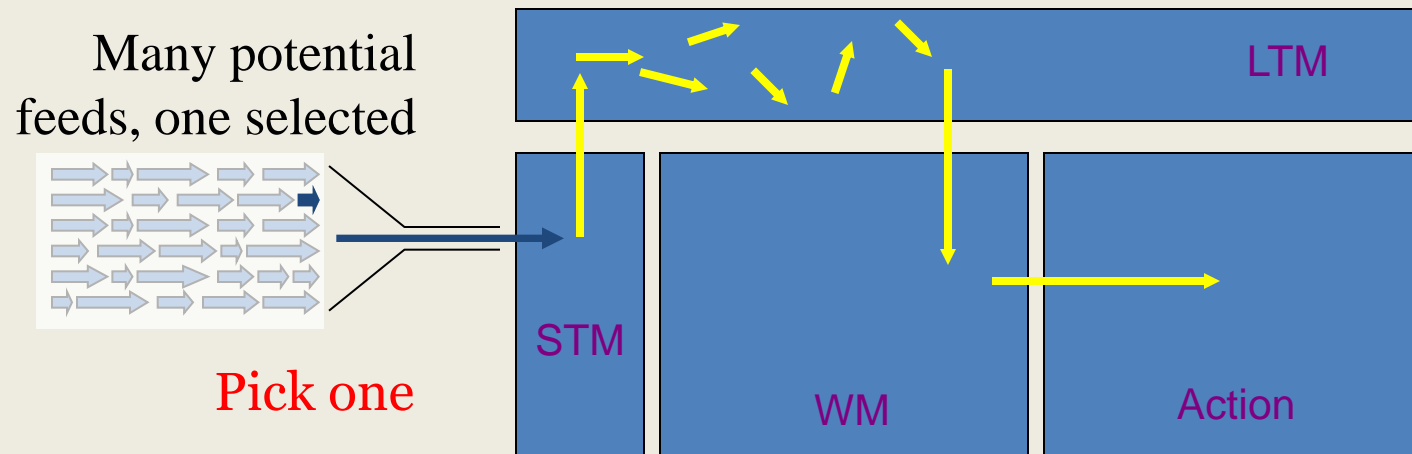
Situation Awareness ...

... prompts decision ... & action

Information Processing Model

18

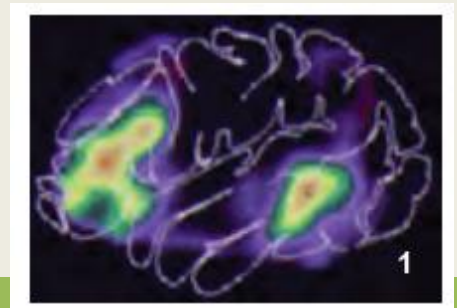
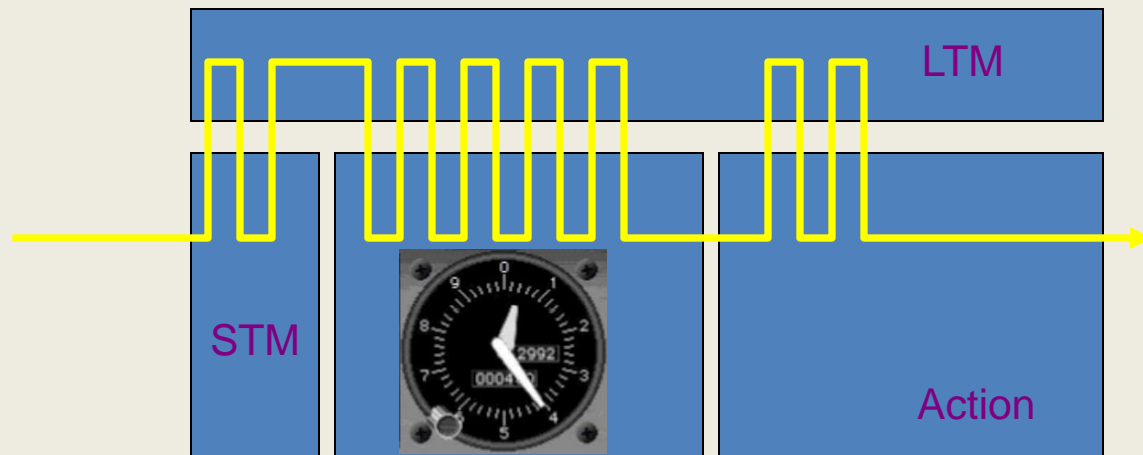
“Standard” operation of model



Information Processing

19

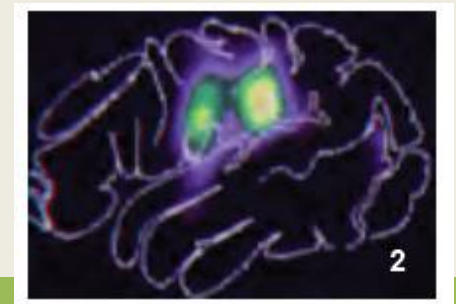
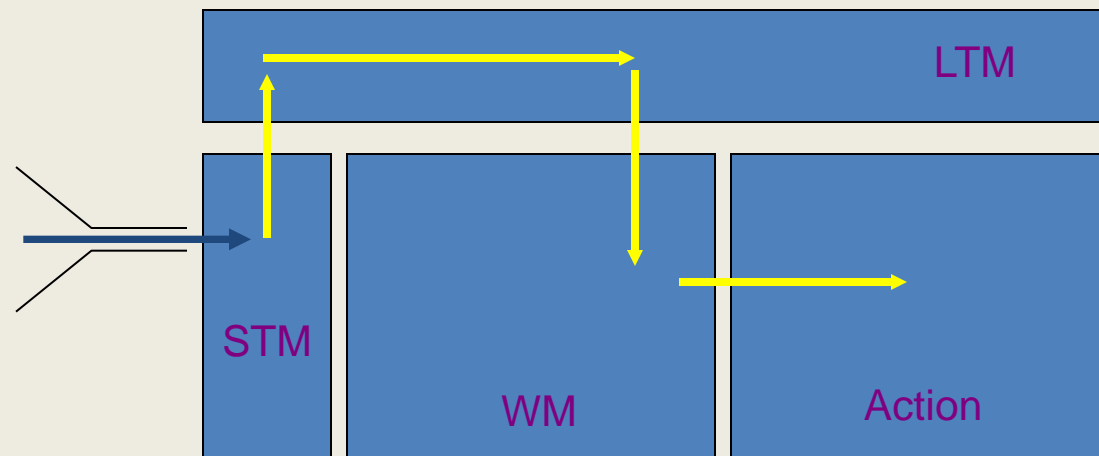
Complex pictures require time to interpret

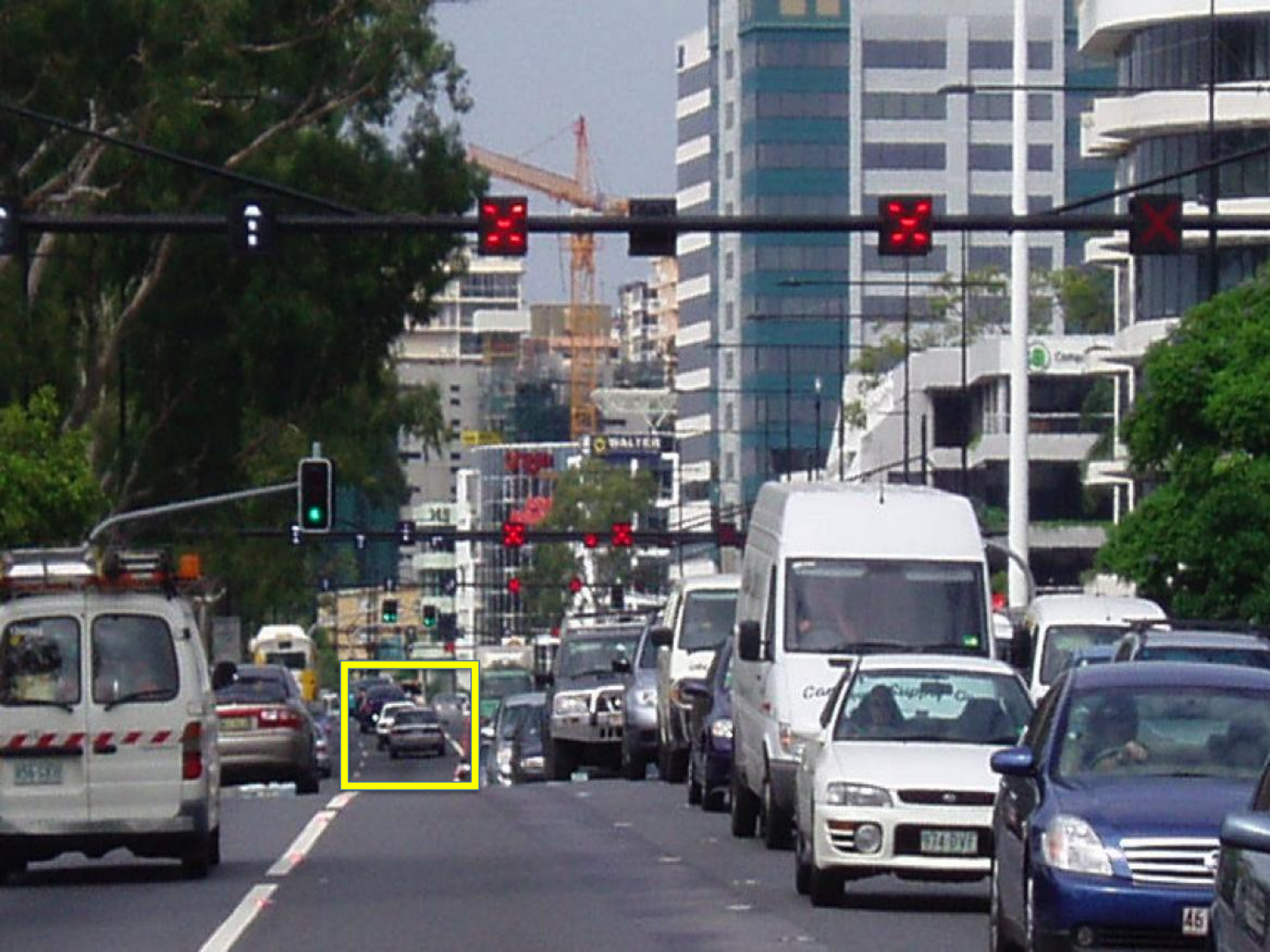


Information Processing Model

20

Learned, well-practised skill





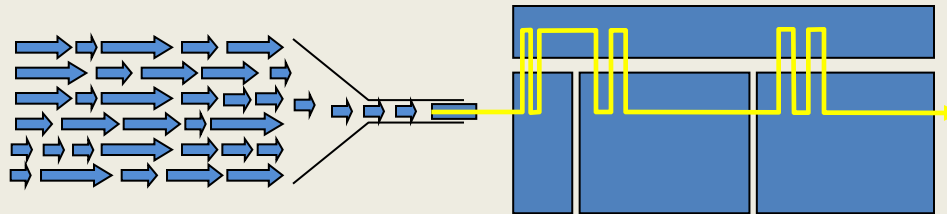


Information Processing

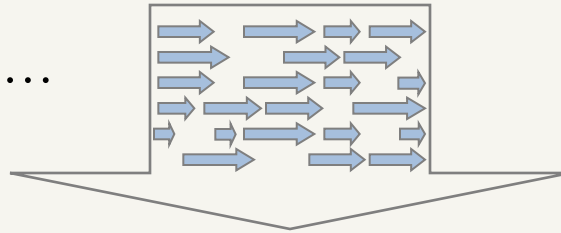
23

Even at high rates of information consumption ...

... a lot of available information is not used



It is “dumped” ...

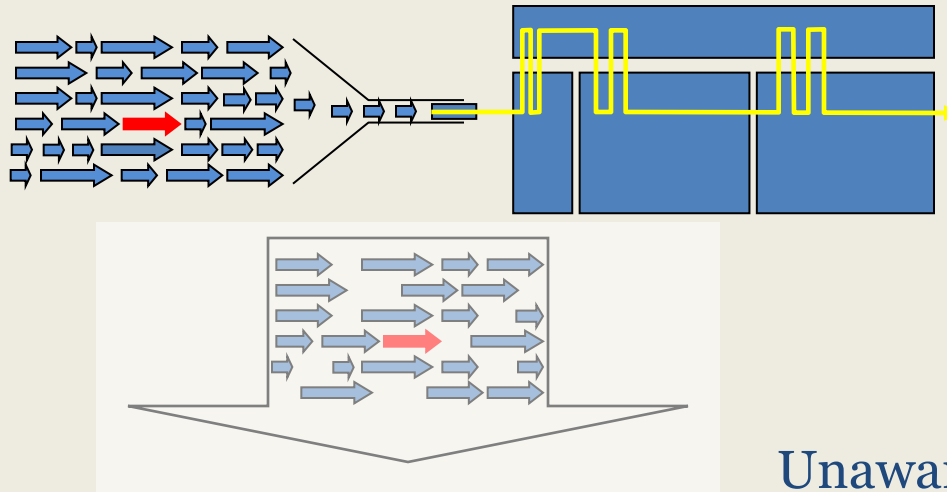


... unaware

Information Processing

24

... and something important might be dumped...



Unaware means ...
...unknowingly

Hazard Detection needs time

25



Situation Awareness Failure

26

Getting the situation wrong, snap decision

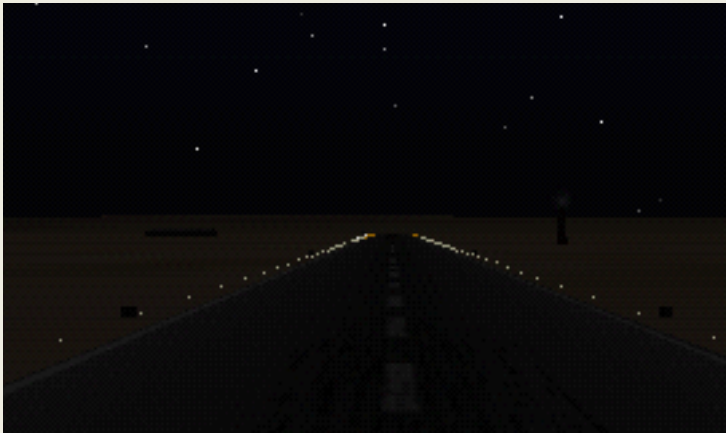


- Learn SA failure countermeasures
 - SA recovery after confusion

Situation Awareness Failure

27

Getting the situation wrong



Situation Awareness ...

+ prompts decision



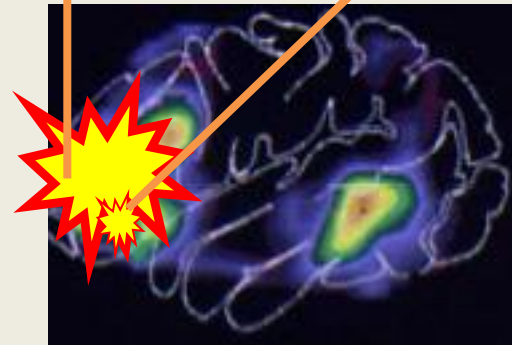
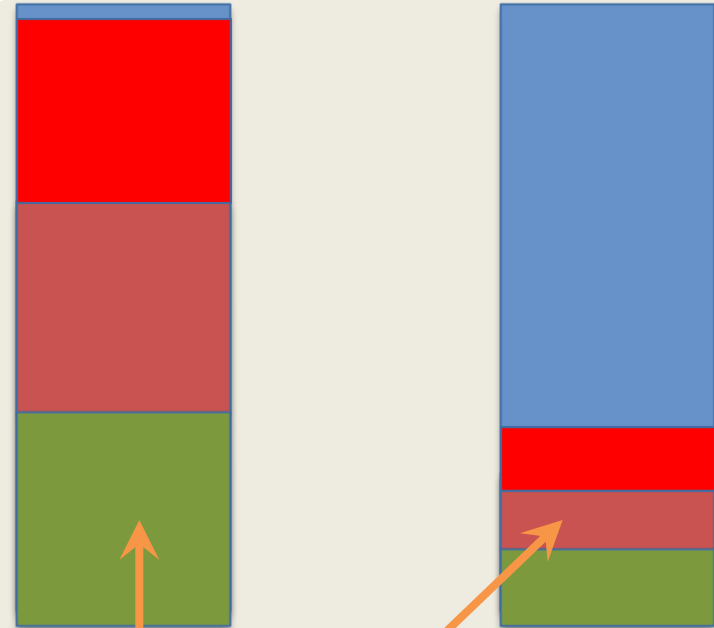
Give The Attribute Space

29



Safety – and learning benefits

The 80s study – training? Safety?



AVIATION
in itself is not
inherently dangerous. But to
an even greater degree than the sea,
it is terribly unforgiving of any
carelessness, incapacity
or neglect.



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