Erasmus School of
Health Policy
& Management

From human error to system resilience: applying Safety Science in healthcare

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Erasmus University Rotterdam

Three schools of psychology



Behaviorism



Cognitive psychology



Joint cognitive systems

Behaviorism



1910 – Crystal Eastman

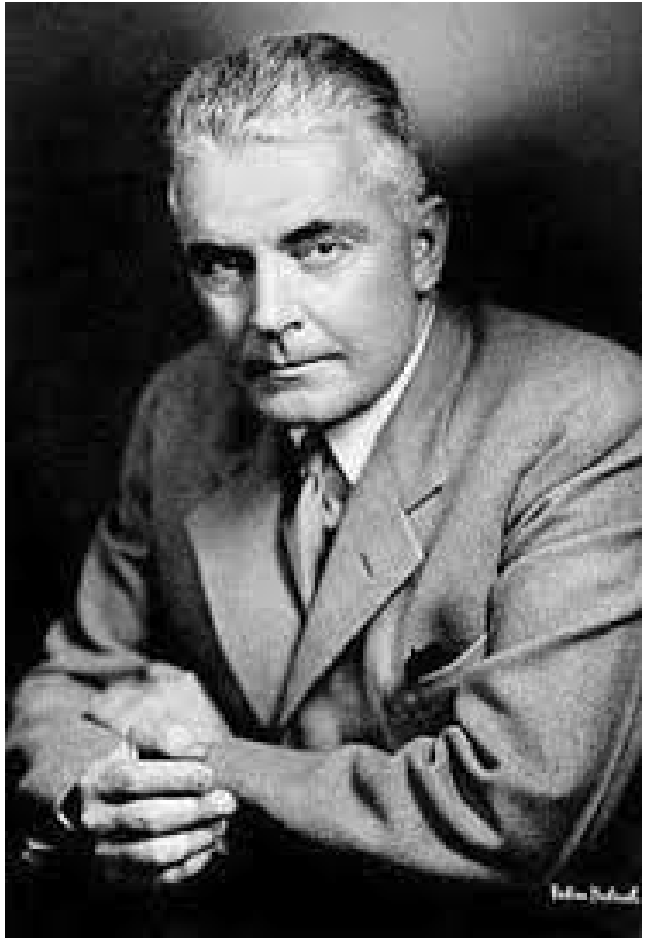


1931 – HB Heinrich



1930 - John Watson

Stimulus -> response



Behaviorism



- Understanding the behavior of humans
- Behavior is
  - a reflex
  - provoked by stimuli
  - consequence of person's history

Practice: Work-processes, guidelines, etc.

Influenced by e.g. 'Carrot & Stick'

Behaviorism



How does this ‘school’ influence current safety thinking in healthcare?

Cognitive psychology



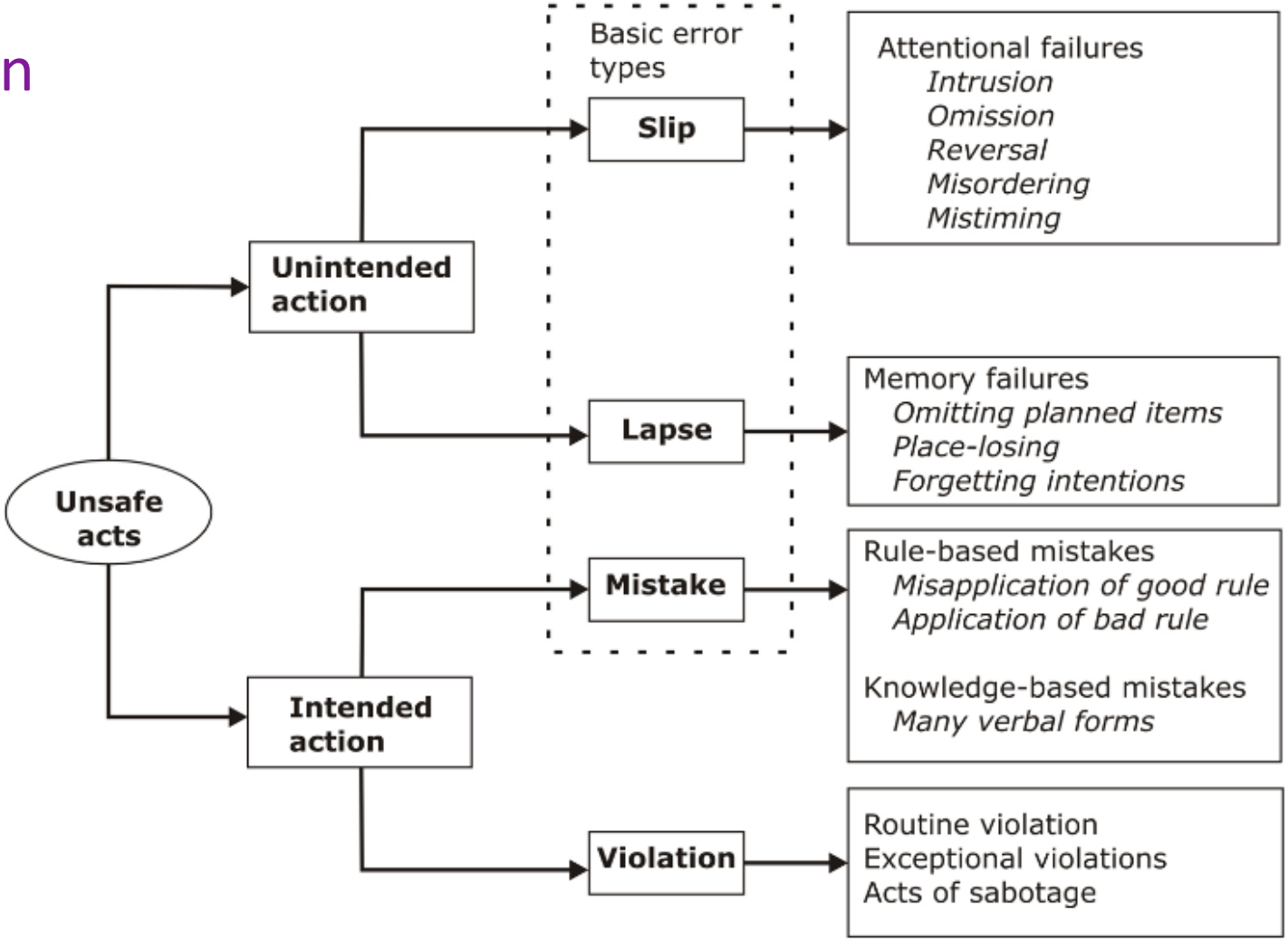
Three Mile Island - 1979



Cognitive psychology – what happens in the brain?

- Attention
- Memory
- Perception
- Problem solving
- Creativity
- ‘Human error’

James Reason



Cognitive psychology



- Understanding how mental processes influence the behavior of humans
- ‘The brain is like a computer’

Practice: education, training, reduce bias, etc.

Influenced by e.g. ‘nudging’

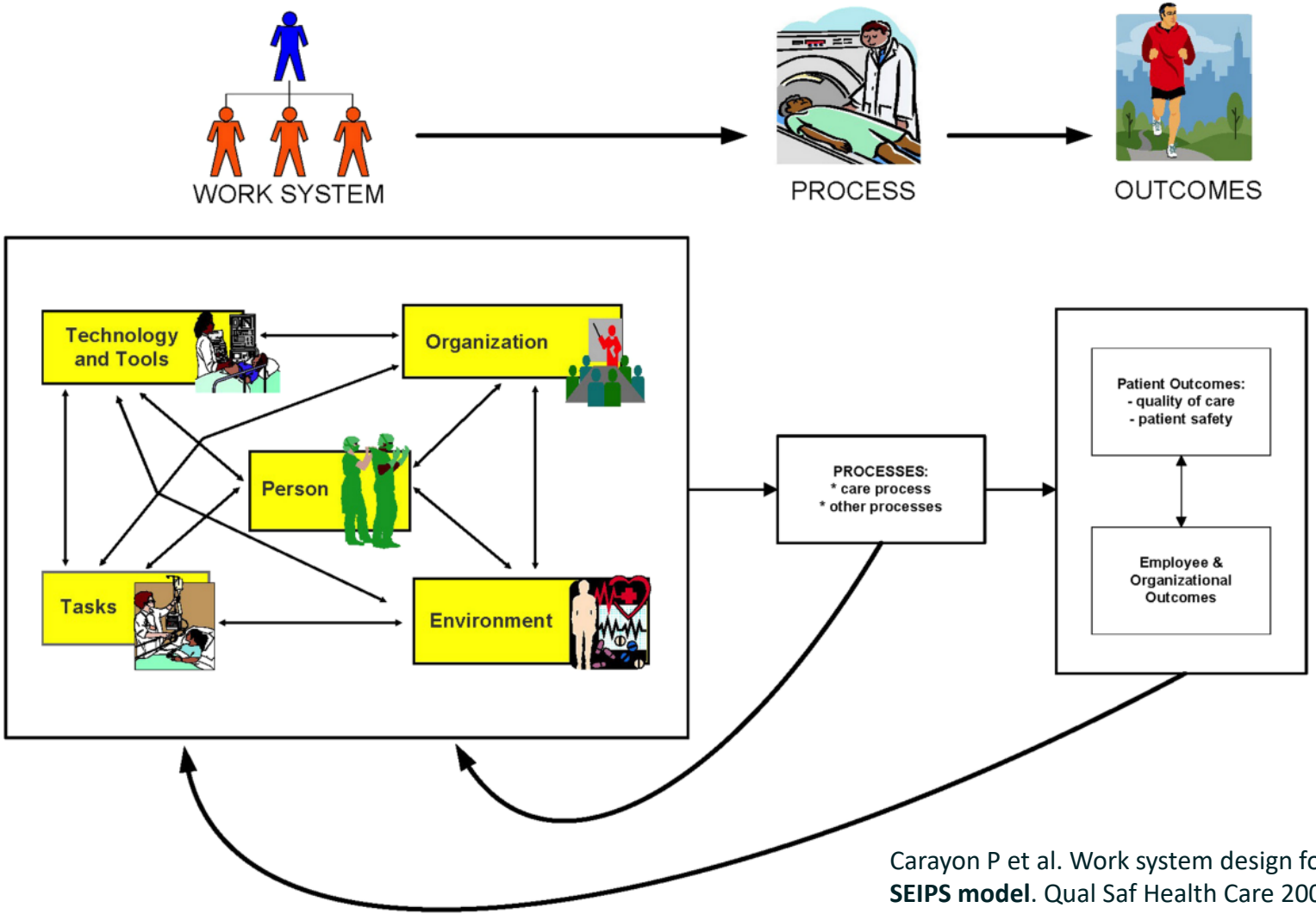
Cognitive psychology



How does this ‘school’ influence current safety thinking in healthcare?

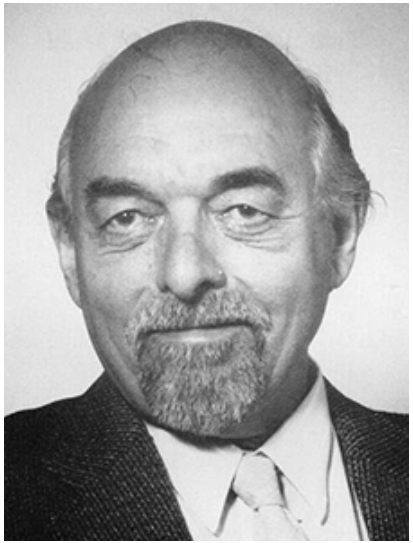
Joint cognitive systems

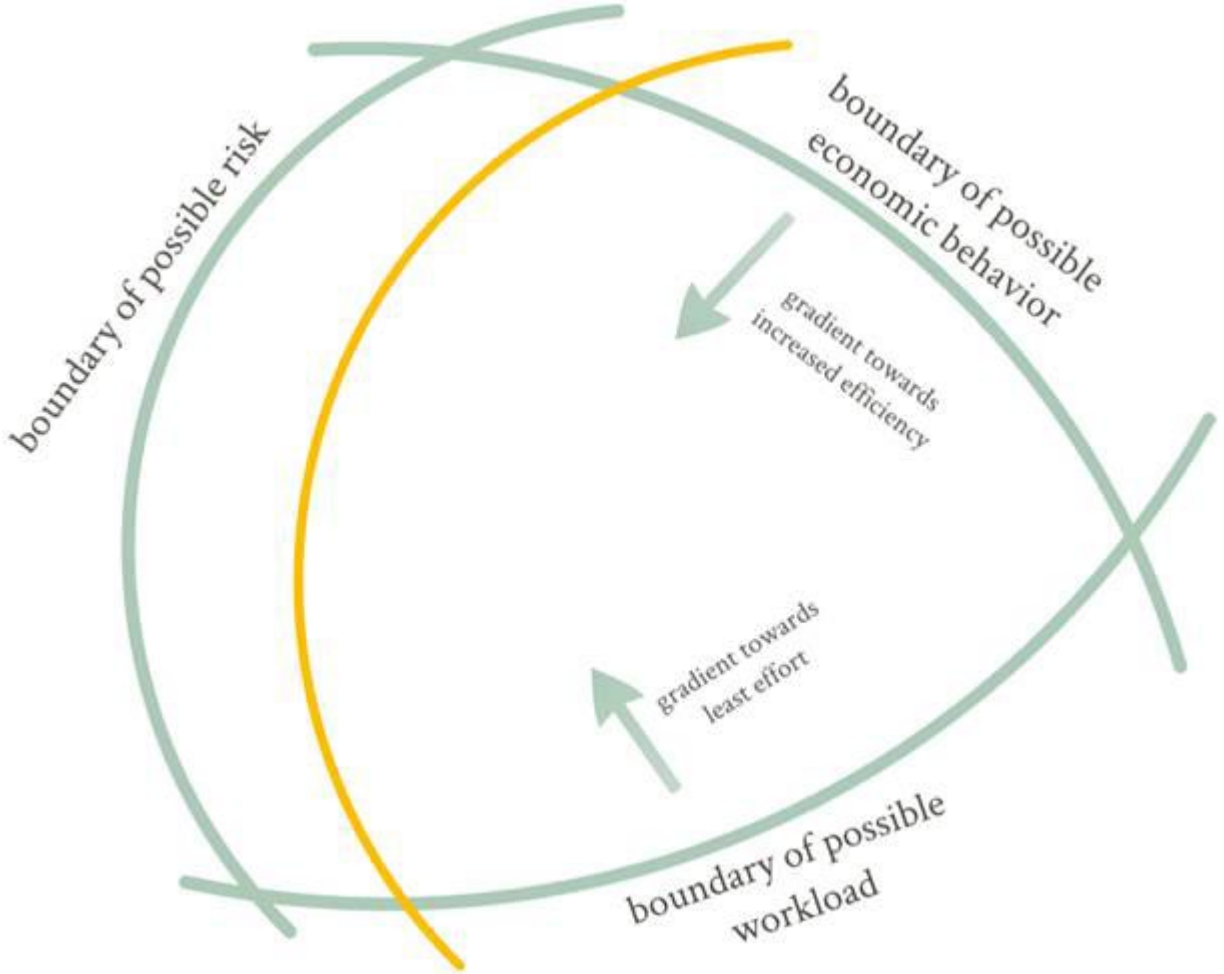




Carayon P et al. Work system design for patient safety: the **SEIPS model**. Qual Saf Health Care 2006;15:i50–8.

Jens Rasmussen





Safety-I versus Safety-II

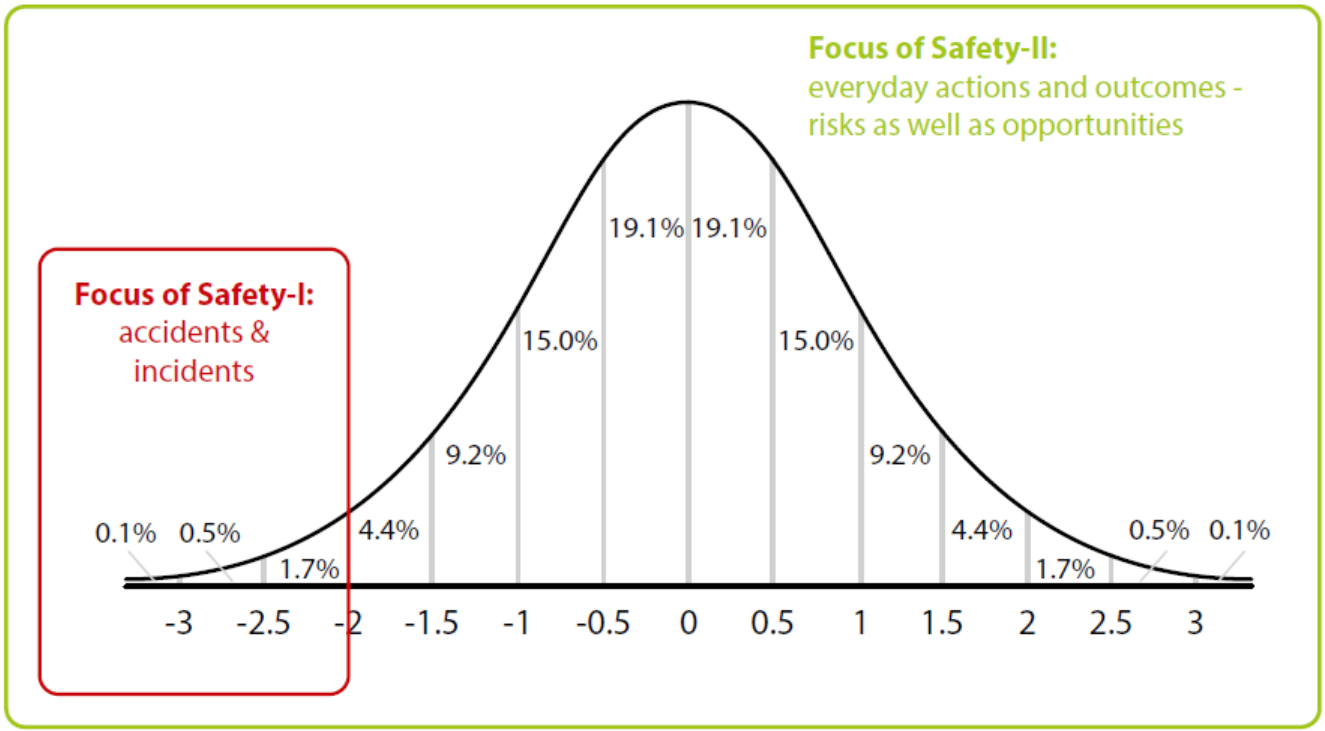


Figure 17: Focus of Safety-I and Safety-II

Joint cognitive systems



- Understanding how the interaction between humans, work and technology influences outcomes
- The whole is more than just the sum of its parts
- ‘Resilience’ & ‘Work As Done’

- ‘What makes work hard?’

Joint cognitive systems



How does this ‘school’ influence current safety thinking in healthcare?

From human error to system resilience



Behaviorism



Cognitive psychology



Joint cognitive systems