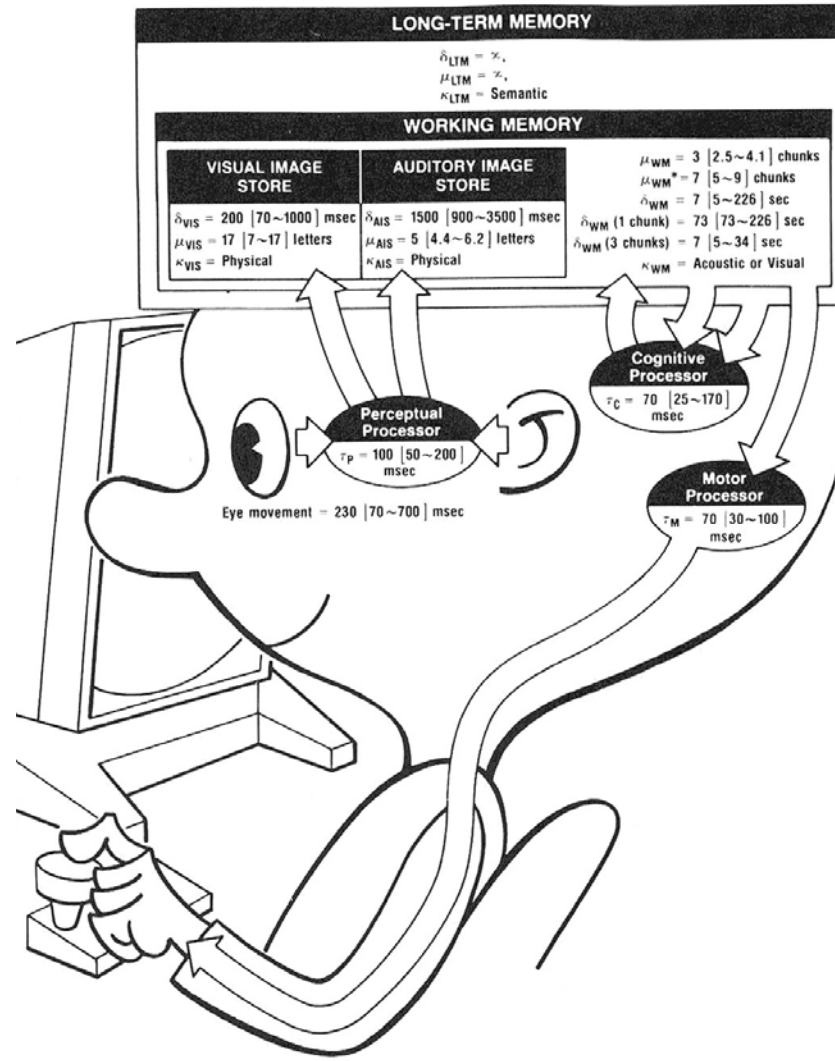


Questions?

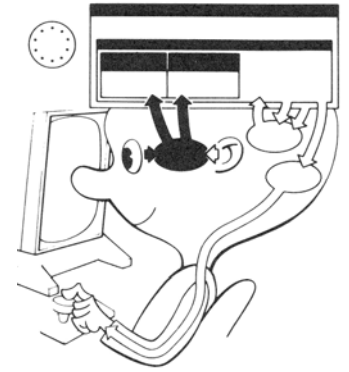
- Project #1

Human Information Processor (Card, Moran, Newell)



Perceptual Processor

- Physical store from our senses: here sight
- Decoded for transfer to working memory
 - Progressive
 - *Example: 10ms/letter*
 - Selective
 - *Spatial*
 - *Pre-attentive: color, direction...*
- Capacity
 - Example: 17 letters



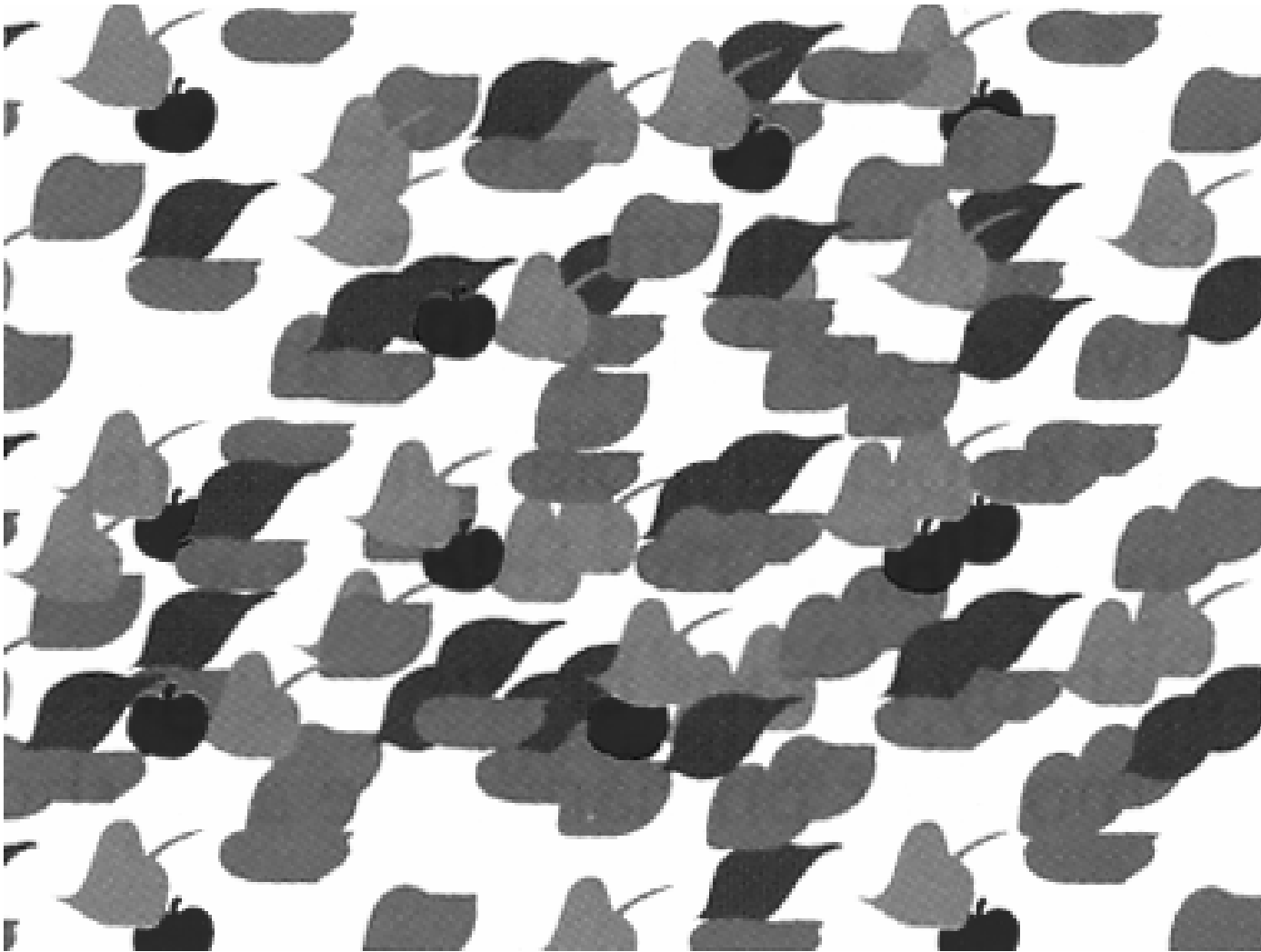
Pre-attentive perception: How many 3s?

85689726984689762689764358922659865986554897689269898
02462996874026557627986789045679232769285460986772098
90834579802790759047098279085790847729087590827908754
98709856749068975786259845690243790472190790709811450
85689726984689762689764458922659865986554897689269898

Pre-attentive perception: How many 3s?

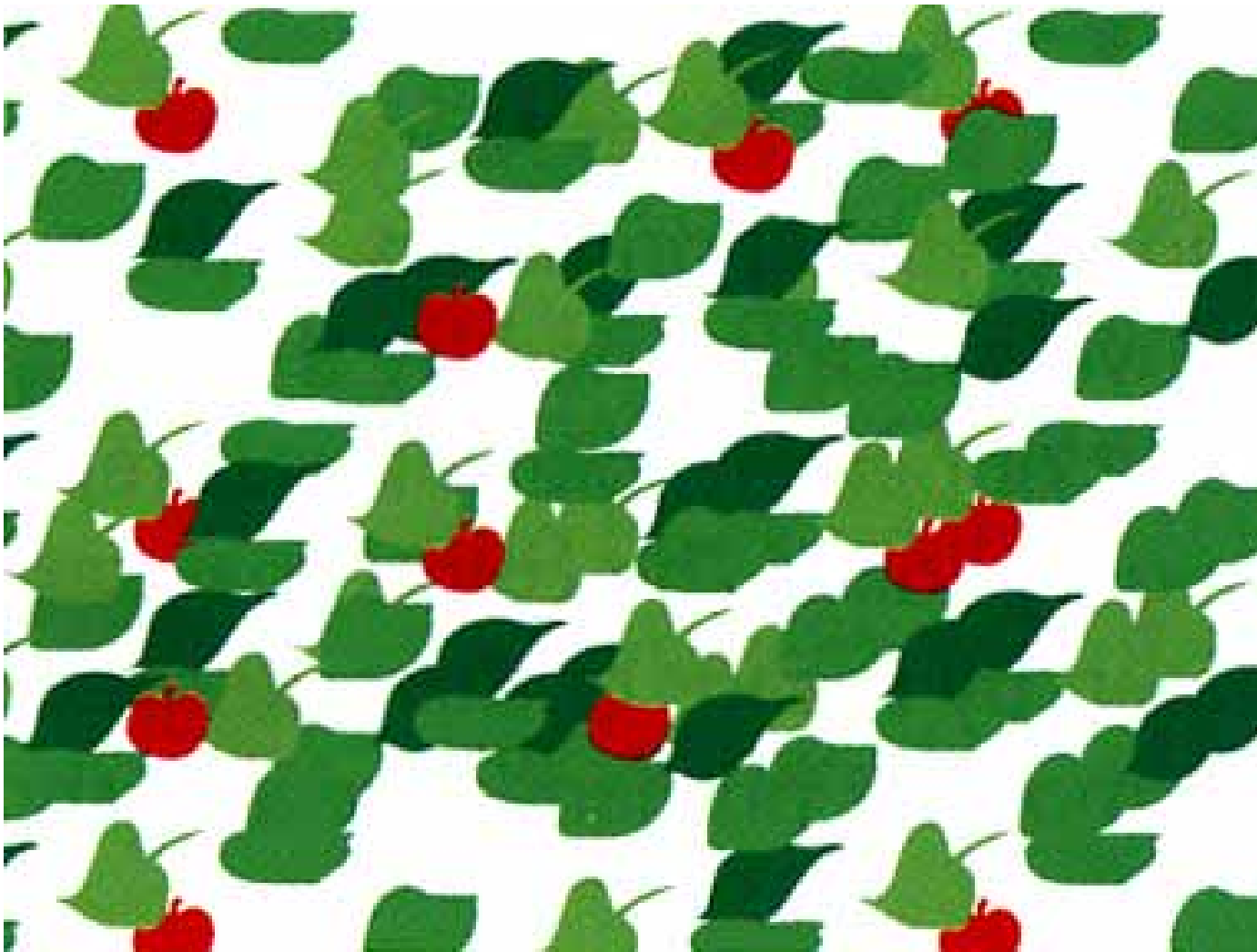
85689726984689762689764**3**58922659865986554897689269898
024629968740265576279867890456792**3**2769285460986772098
908**3**4579802790759047098279085790847729087590827908754
9870985674906897578625984569024**3**790472190790709811450
85689726984689762689764458922659865986554897689269898

Where are the cherries?



From Information Visualization, C. Ware

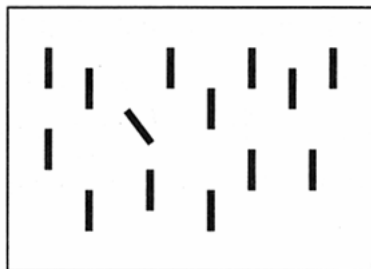
Where are the cherries?



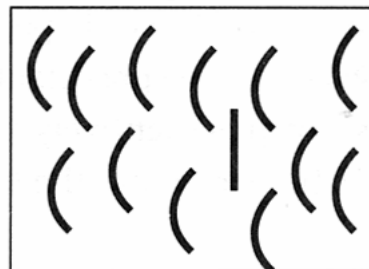
From Information Visualization, C. Ware

Other examples of pre-attentive variables

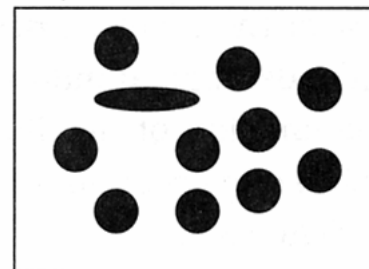
Orientation



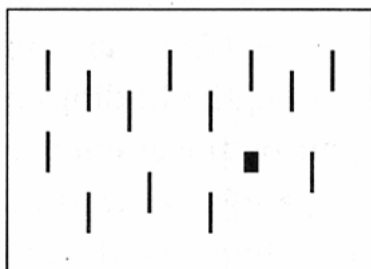
Curved/straight



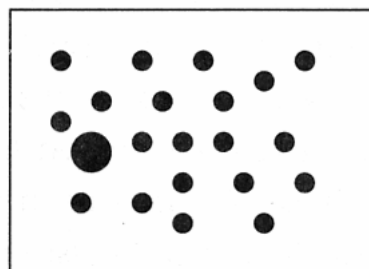
Shape



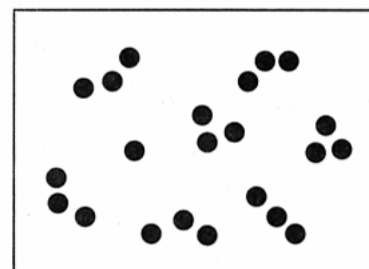
Shape



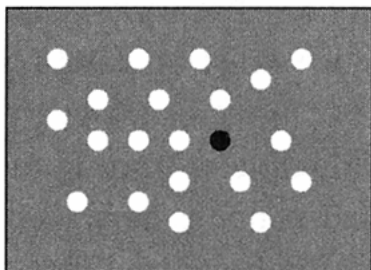
Size



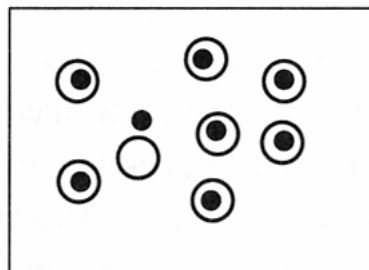
Number



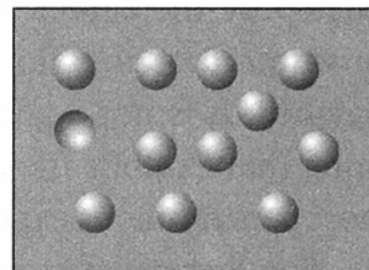
Gray/value



Enclosure



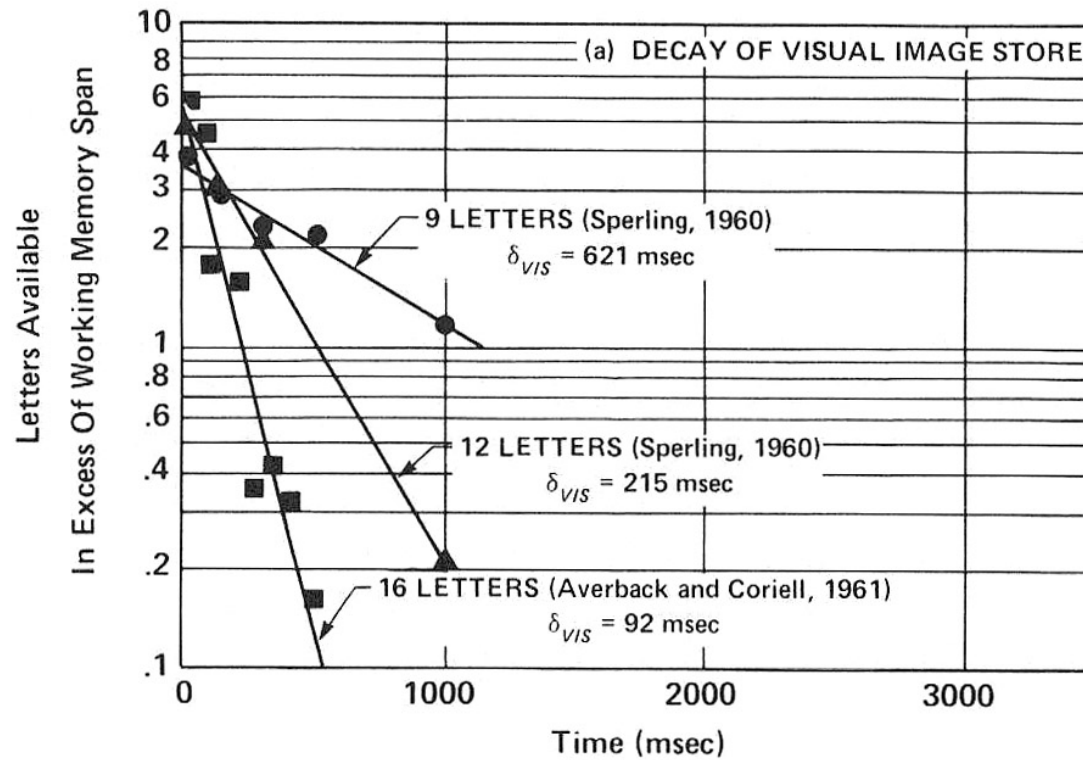
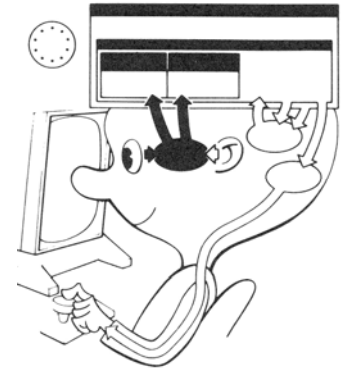
Convexity/concavity



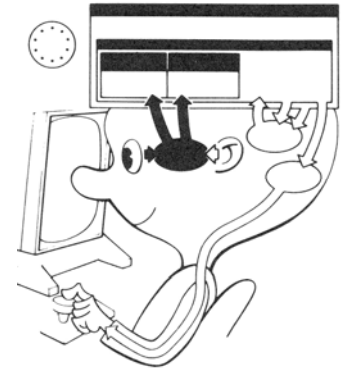
From Information Visualization, C. Ware

Perceptual Processor

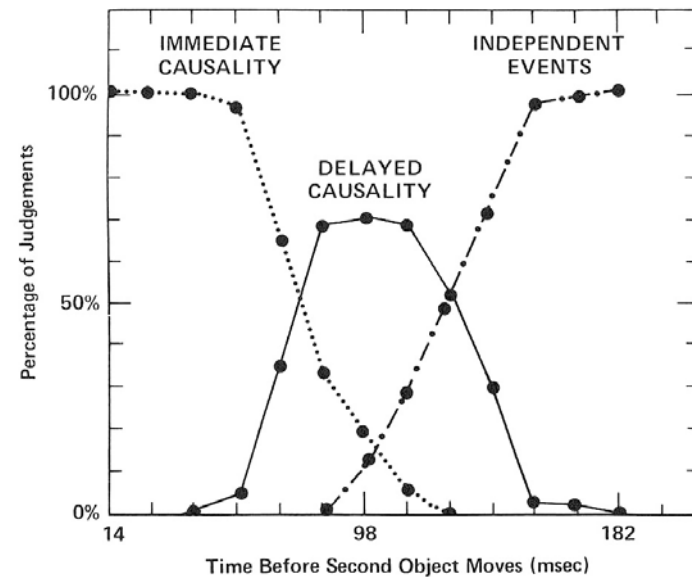
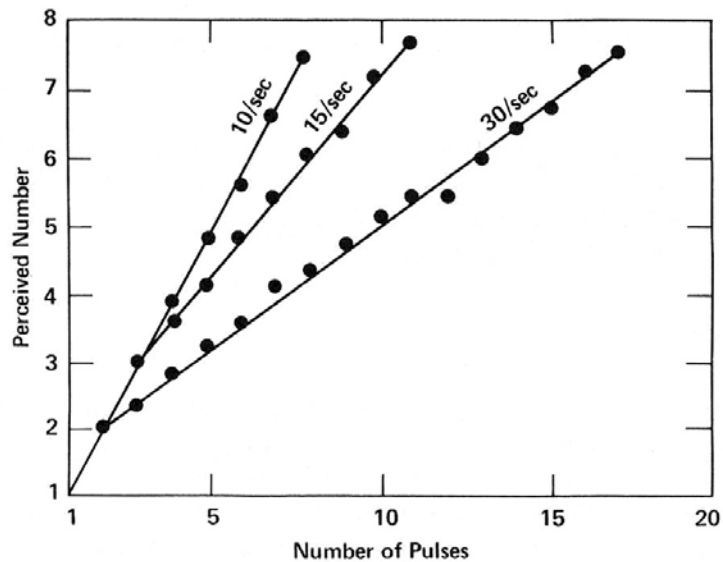
- Decay: 200ms



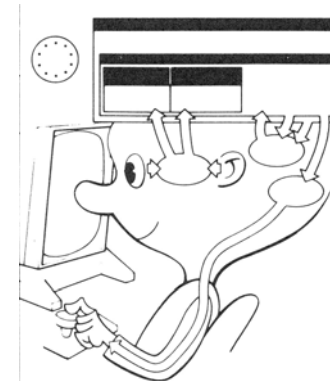
Perceptual Processor



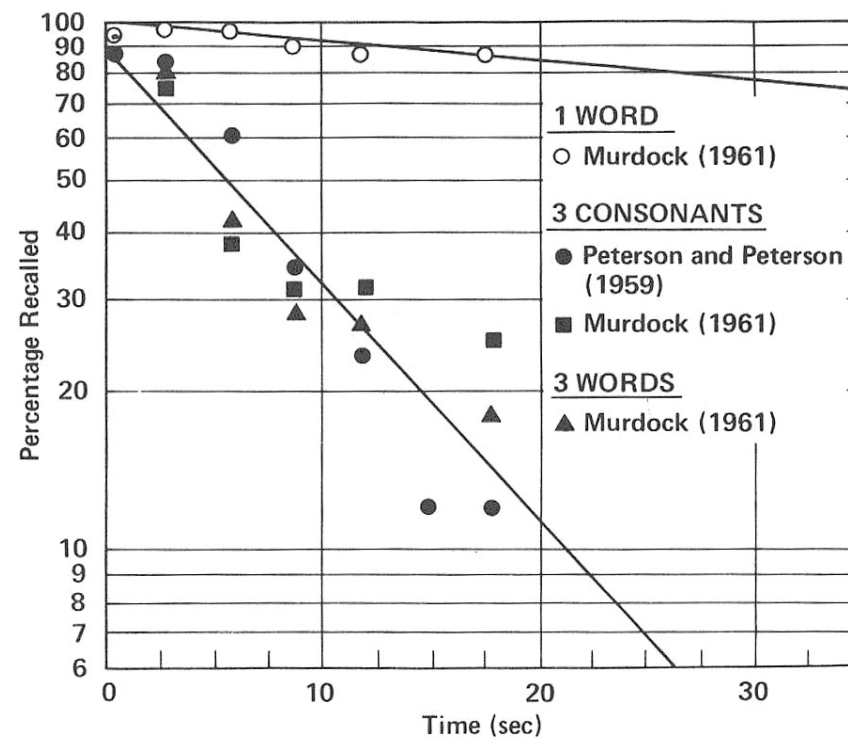
- Cycle time
 - Quantum experience: 100ms
 - *Percept fusion*
 - *Causality*



Working Memory

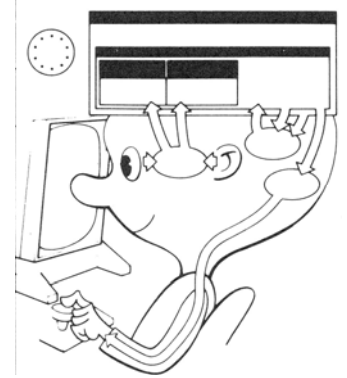


- Access in chunks
 - Task dependent construct
 - 7 ± 2 (Miller)
- Decay
 - Content dependant
 - Limit attention span



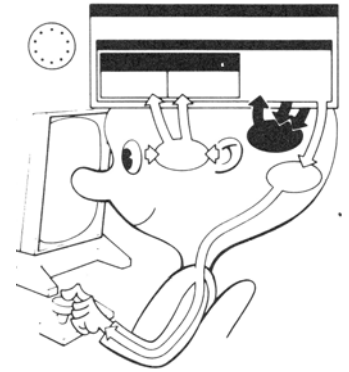
Long term memory

- Very large capacity
 - Semantic encoding
- Associative access
 - Fast read: 70ms
 - Expensive write: 10s
 - *Several Rehearsal and/or recall,*
- Context at the time of acquisition key for retrieval
- Noisy



Cognitive Processor

- Cycle time: 70ms
 - Can be modulated
- Typical matching time
 - Digits: 33ms
 - Colors: 38ms
 - Geometry: 50ms...
- Fundamentally serial
 - One locus of attention at a time
 - *Eastern 401, December 1972*
 - Crew focused on checking the landing gear indicator bulb,
 - Meanwhile the aircraft is losing altitude (horn, warning indicator...),
 - Aircraft crashed in the Everglades
 - see “The Human Interface” by Raskin, p25
 - *But what about driving and talking?*



Motor Processor

- Receive input from the cognitive processor
- Execute motor programs
 - Pianist: up to 16 finger movements per second
 - Point of no-return for muscle action

