Passion and Purpose: Transforming Retirement

Human Memory, Aging, and the Brain or Where Did I Put Those Keys?

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Human Memory: How Do We Learn?

- **The Problem:** Most people view learning as a “bottom-up” process (passive learning).
- BUT, efficient learning depends on using knowledge to guide and organize perceptions (active learning).
- Psychologists call this *top-down* processing.

> Learning is an active process: We use top-down processing to select and elaborate on what is perceived.
Active Learning and the Brain

• Think of the brain as a large corporation.
• The prefrontal cortex (PFC) is your CEO that oversees processing.
• The PFC engages top-down processing by selecting and activating posterior regions.
• This PFC-posterior network is active when we recollect the past and think about the future.

Active Learning and the Brain

The Generation Effect

• Self-generation of information IMPROVES MEMORY.
• Read: GARBAGE-WASTE
• Generate: QUARREL-F_GHT

(Rosner & Shimamura, 2011)
In normal aging, the PFC is the most vulnerable region associated with neuronal changes. These changes are related to frequent complaints among older individuals:

- Word finding (e.g., names to faces)
- Recollecting recent events (new learning)
- Source memory (who? where? when?)
- Planning to do things later (taking pills)

In Alzheimer’s Disease it is the PFC-posterior network that is particularly affected.
A new marker for amyloid plaques: Pittsburgh Compound B (PiB).
Used during PET scans to identify regions with plaque deposits.

Dr. William Jagust (UC Berkeley) is a leader in Alzheimer’s research.

Recent Findings From Alzheimer’s Research

Aging & Cognitive Decline: It Varies!

Cognitive performance across the adult lifespan.
Performance declines slowly across the years.

BUT, there is significant variability amongst older adults.
Some show large declines, others perform as well as 20 yr olds.

Although your genes play a large role, there are things you can do to facilitate successful aging...
Research Article

MEMORY AND COGNITIVE ABILITIES IN UNIVERSITY PROFESSORS:

Evidence for Successful Aging

Arthur P. Shimamura, Jane M. Berry, Jennifer A. Mangels, Cheryl L. Rusting, and Paul J. Jurica
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Some aspects showed normal aging declines in professors:
1) motor reaction time
2) arbitrary memory associations (e.g., new names and faces)

Some aspects of memory did not show typical aging declines:
1) conceptual memory (add new facts to existing knowledge)
2) susceptibility to interference

Mnemonic Tips for Remembering

• Pay Attention
  - Faces & names
  - Preventing “car amnesia”
  - Never put things in “special” places

• Rely on Technology
  - Paper notes/Post-its
  - Smart phones: phone #s, people, places, parking, facts (resolving arguments)

• Be Responsive (generation effect)
  - Use your knowledge!
  - Tell people about what you’ve learned
  - The best way to learn is to teach

Memory, Aging, and the Brain

Arthur Shimamura
Get SMART
A 5-Step Program for Successful Aging

Get Social!
- Meet with friends
- Join a club
- Volunteer your services
- Meet someone new and chat…

Memory, Aging, and the Brain

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Get **SMART**
**A 5-Step Program for Successful Aging**

**Get Moving!**

- Exercise daily!
- Walk with a friend or a dog
- Join a health club
- Get physical!

**Get Artistic!**

- Get out those paints or that camera!
- Practice that old instrument or learn a new one!
- Join a crafts/music group
- Dance, sing, cook, be creative!
Get SMART
A 5-Step Program for Successful Aging

**Get Responsive!**

- React to your environment!
- Tell someone what you know every day (generation effect)
- Join a discussion group: Knowledge & aesthetics (book club, movies)
- Teach! Blog!

**Get Thinking!**

- Learn something new every day (& write it down–keep a diary)
- Best way to learn is to teach
- Go to a museum, lecture, library
- Use YouTube! & other internet sources
Don't Forget....
USE IT OR LOSE IT!