



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

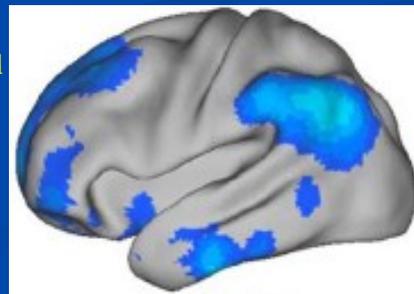
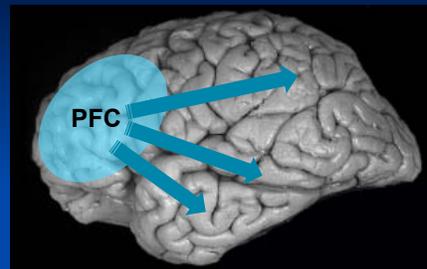
Knowledge (memory) top

up ↑ *bottom*

Perception down

Active Learning and the Brain

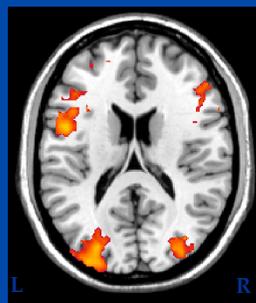
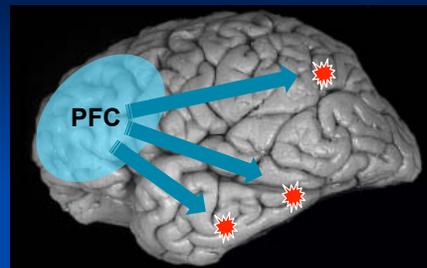
- Think of the brain as a large corporation.
- The prefrontal cortex (PFC) is your CEO that oversees processing.
- The PFC engages top-down processing by selecting and activating posterior regions.
- This PFC-posterior network is active when we recollect the past and think about the future →



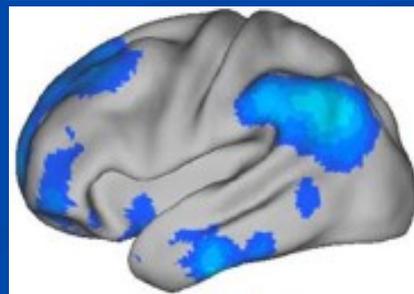
Active Learning and the Brain

The Generation Effect

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

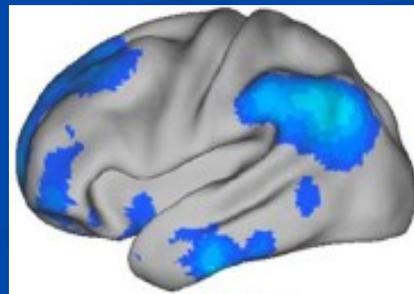
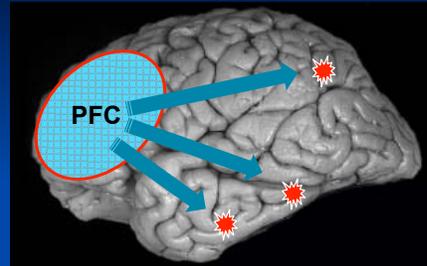


(Rosner & Shimamura, 2011)



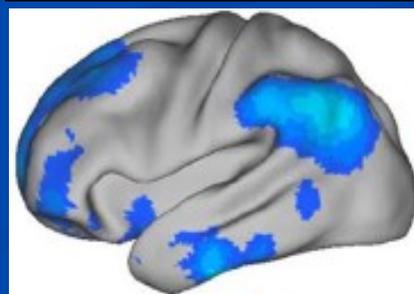
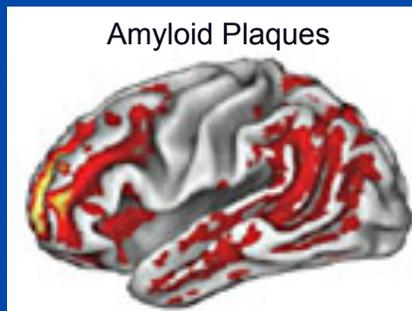
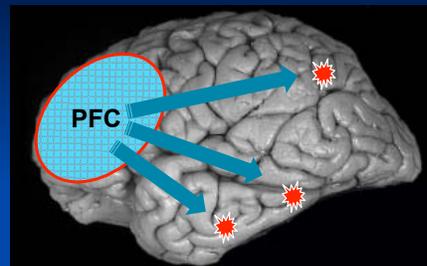
Memory & Aging (the bad news)

- 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)



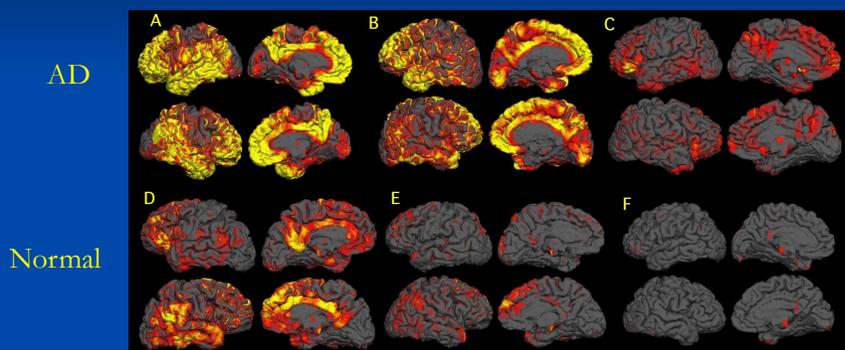
Memory & Aging (the bad news)

- In normal aging, the PFC is the most vulnerable region associated with neuronal changes.
- In Alzheimer's Disease it is the PFC-posterior network that is particularly affected.



Recent Findings From Alzheimer's Research

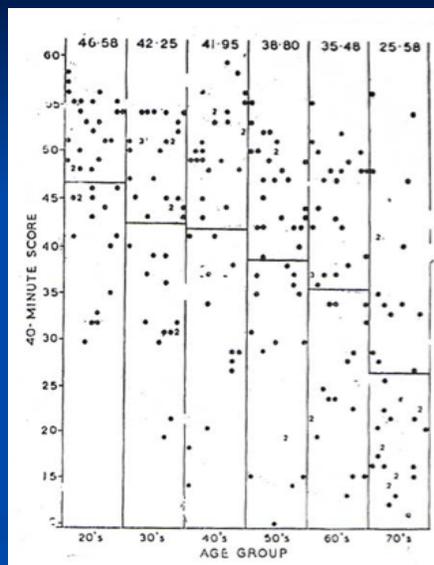
- A new marker for amyloid plaques: Pittsburgh Compound B (PiB).
- Used during PET scans to identify regions with plaque deposits.



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

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...



PSYCHOLOGICAL SCIENCE, VOL. 6, 1995

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
 University of California, Berkeley

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



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...



A collage of four photographs illustrating social activities. Top left: Two elderly women, one in a yellow shirt and one in a pink shirt, are talking. Top right: A group of elderly men are sitting around a table playing cards. Bottom left: A large group of elderly people are posing for a group photo. Bottom right: A group of elderly people are gathered around a table, looking at a laptop screen.

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!



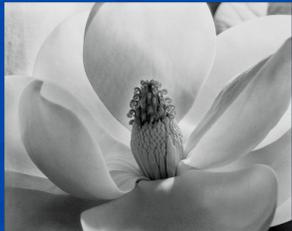
Sun City Roseville Cycling Club

Get SMART

A 5-Step Program for Successful Aging

★ 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 SMART

A 5-Step Program for Successful Aging

★ 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!