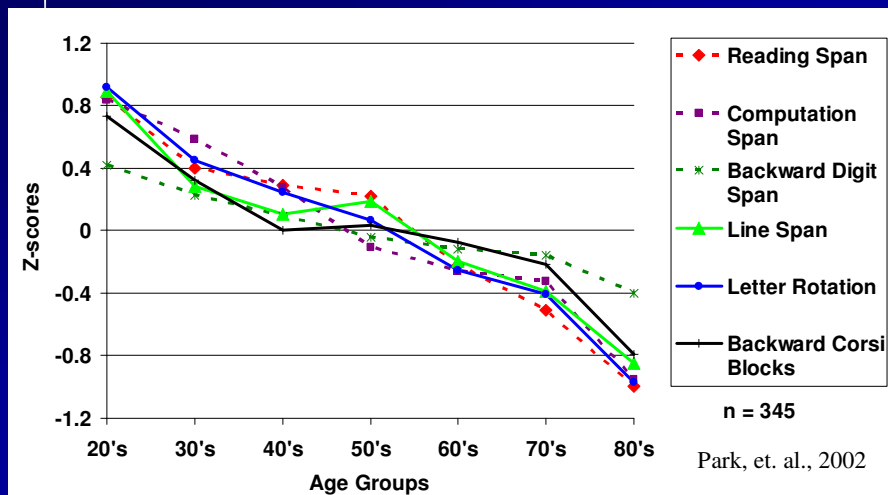


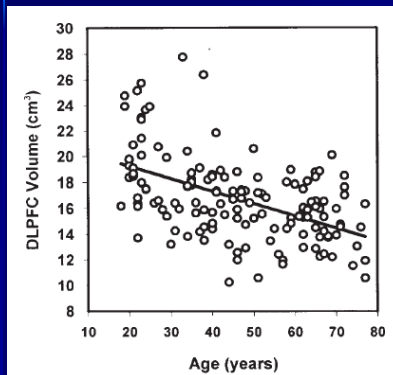
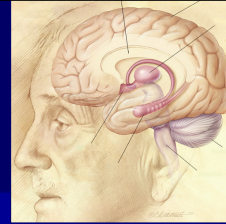
Cognitive Neuroscience of Aging

Angela Gutchess
Department of Psychology

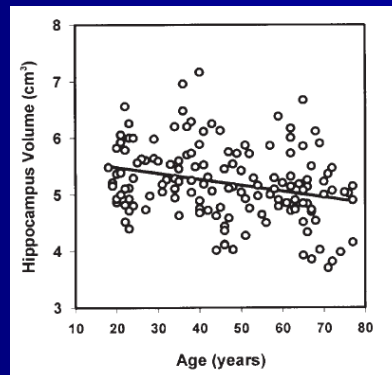
Working Memory Ability across the Adult Lifespan



Reduced volume of brain with age



Frontal cortex



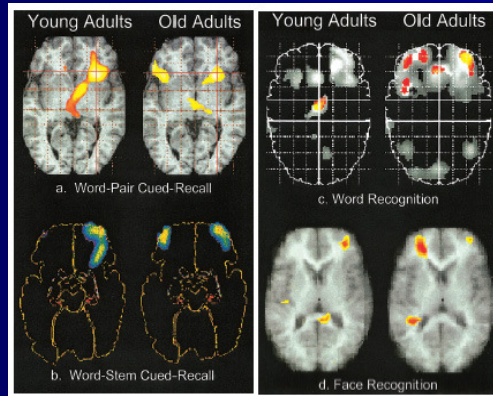
Hippocampus

Raz et al. (1997)

Neural changes with age

- Neural activation with age suggests flexibility rather than simple pattern of decline
- Flexibility in the engagement of cognitive and neural resources
 - Compensation?

Bilaterality in older adults



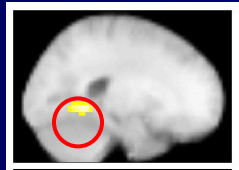
HAROLD
(hemispheric
asymmetry reduction
in older adults)

Figure from Cabeza, 2002

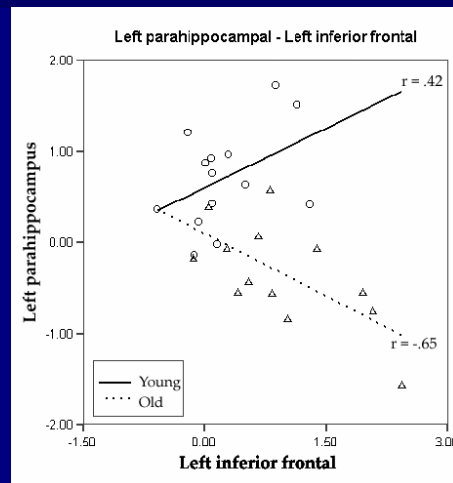
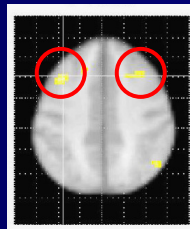
- a: Cabeza et al., 1997
- b: Bäckman et al., 1997
- c: Madden et al., 1999
- d: Grady et al., 2002

Frontal shift with age during successful encoding

Younger > Older adults



Older > Younger adults



Gutchess et al. (2005), JoCN

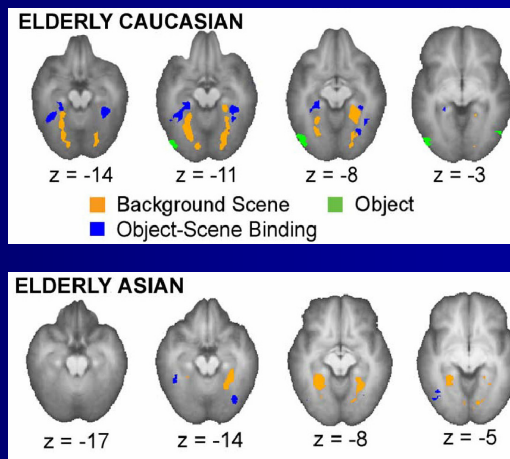
Cultural experiences

- Cultural experiences impact cognitive aging
 - Knowledge, language, strategy use
 - Aging: ↑ greater absorption of culture; cognitive decline
 - Magnify effects of culture on automatic low-effort processes
- Cultural differences in attention to object vs. context

fMR-Adaptation with age

Culture differences with age

Older Americans, but not older East Asians, show object adaptation.



Goh et al., 2007, *CABN*

Summary

- Flexibility in cognition with age
 - Neural reorganization
 - Cultural differences in the effects of aging on automatic processes
- Ways to enhance compensatory activity with age?

Aging, Culture, & Cognition Lab

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